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EDITED BY

WILLIAM PROCTER, Jr.

Professor of Pharmacy in the Philadelphia College of Pharmacy.

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JANUARY, 1851.

OBSERVATIONS ON AN OLEO-RESIN FROM VENEZUELA.

By WILLIAM PROCTER, JR.

The substance forming the subject of the following remarks was placed in my hands by Mr. Avery Tobey, pharmacist, of this city, with the information that it was brought from South America by Capt. J. B. Thomas. It appears that this gentleman, during his sojourn in that region, obtained a quantity of this "native oil of laurel, or sassafras," as it is called. No accurate knowledge was obtained of its origin, further, than that the tree producing it is very large and resembles the cedar, that it grows on the banks of the river Orinoko, four hundred miles from its mouth, and that the oleo-resin is obtained by direct incision into the trunk, in the manner of extracting copaiba. It would further appear that a very high value is set on its medicinal virtues, as its exportation is prohibited. The lot brought by Capt. Thomas, cost him three dollars and a half per gallon in South America. Not many months since a notice was observed in the *Journal de Pharmacie*, of a very fluid oleo-resin obtained in the neighborhood of Maracaibo, and which was employed to adulterate copaiba. Is it identical with the "oil of laurel," or an analogous product? I have not been able to elicit any further information from the parties above mentioned, but believing the substance to be possessed of some interest both chemically and medicinally, hope that it may engage the attention of some person having correspondence with Venezuela.

The label on the bottle recommends the "Acceite de Sassafras," as a sudorific and diuretic in rheumatism, gout, etc., "fortifying

the internal parts." It imparts a peculiar odor to the perspiration and urine, and invigorates the nervous system. The dose is stated as from twenty to fifty drops twice a day according to circumstances.

"Oil of Laurel" has a light amber color, a penetrating persistent and peculiar odor, and an aromatic, somewhat bitter, and not very pungent taste, which perhaps may be called slightly camphorous. There is nothing in the taste or smell that reminds one of copaiba. Its specific gravity is .898. Distilled carefully *per se*, nearly the whole passes over as a very limpid colorless volatile oil, leaving a small quantity of soft, dark-brown, transparent resin in the retort. The odor of the oil is different, but analogous to that of the oleo-resin itself. When freshly obtained its smell is sufficiently like that emitted by good socotrine aloes, when breathed upon, to call it to mind. Its taste is like that of the native product. This volatile oil is soluble in all proportion in alcohol .798, and in ether, and requires but five times its bulk of alcohol .838 for solution. It mixes readily with other volatile oils with fixed oil, and chloroform, and is soluble in acetone, and pyroxilic spirit. It dissolves more than its bulk of camphor with the assistance of heat, and becomes a soft crystalline solid by cooling. It dissolves resinous bodies with facility, and its ready volatility would render it a suitable menstruum for varnishes. A hot concentrated solution of caustic potassa has no action on it; when a globule of bright potassium is put into a small quantity of the colorless oil, it has no immediate action on it, but by standing the metal becomes surrounded by a dark-brown, transparent, resinous mass, evidently indicating the presence of oxygen in the oil. This reaction, together with its ready solubility in alcohol .838, will readily distinguish the oil from recent oil of copaiba which is unaffected by potassium, and is but slightly soluble in alcohol of the sp. gr. indicated.

Dropped on powdered iodine it detonates slightly; sulphuric acid instantly changes its color to red, and when hot destroys it; and strong nitric acid acts with violence.

ON THE MEANS FOR DETERMINING THE PURITY OF CERTAIN CHEMICALS AND DRUGS, AND FOR DETECTING ADULTERATIONS.

[The importance of a knowledge of certain and decisive means for determining the purity of chemicals and drugs, to the druggist, apothecary, and physician, need hardly be averred. Impressed with this belief, the Philadelphia College of Pharmacy entertained the idea of, and appointed a committee to prepare, a small book or pamphlet of test directions for general circulation, but various circumstances have prevented that committee from accomplishing the task, which presents some difficulties and requires a considerable expenditure of time. It occurred to us that the object of the College might be gained in a less formal manner by contributions published from time to time in this Journal under the above head, without reference to any alphabetical or systematic order; and if at a future time, the College should deem it advisable, the several articles which may have been published can be arranged and republished in a more compact and systematic form. It is intended, to make the notices as complete as possible, to give the reasons for the test directions when not so obvious as to render it unnecessary, and to base them on the notes appended to substances in the Pharmacopœia when these are deemed sufficiently full to justify it. As no claims to originality are preferred by the writers of these articles, they will avail themselves of all sources of information, and in most instances without giving reference to authorities, which would swell the bulk of the articles unnecessarily. The Editor in commencing this work hopes that all who feel disposed to contribute essays towards the end in view, will freely do so.—EDITOR.]

Iodide of Potassium.—Pure iodide of potassium is in opaque white, or occasionally in transparent colorless crystals, is dissolved by its weight of cold water, and is soluble in alcohol. If diluted sulphuric acid be added to its solution in starch water, but little if any change is at first perceptible, but gradually it assumes a purplish tint, and finally after some hours becomes blue. The sulphuric acid decomposes the salt, producing sulphate of potassa, and hydriodic acid, which last is gradually decomposed into iodine and water by exposure to the air, causing the gradual coloration of the starch. If, however, any *iodate* of potassa is present, the hydriodic acid immediately decomposes it, liberating iodine, which instantly colors the starch deep blue. Bichloride of platinum causes a brownish red color when added to its aqueous solution, without any precipitation of chloro-platinate of potassium. When an excess of a strong solution of tartaric acid is added to a strong solution of the

iodide, a crystalline precipitate of bitartrate of potassa is thrown down, and the supernatant liquid gradually becomes colored as when diluted sulphuric acid is used, and from the same cause.

Chloride of barium but slightly if at all changes the solution, and proto-sulphate of iron not at all. If a whitish or greenish white precipitate should be occasioned by a solution of proto-sulphate of iron, which effervesces on the addition of a diluted acid, the iodide contains carbonate of potash, which it sometimes does to the extent of 15 per cent. or more when it has been crystallized from a saturated solution of that carbonate. In such a case turmeric paper will be colored brown by its solution, and reddened litmus paper restored to blue. If ten grains of the iodide in solution in water, be mixed with an excess of a solution of nitrate of silver, a lemon yellow precipitate of iodide of silver is thrown down, which, when washed and dried, weighs 14.1 grains if the iodide is pure, and if the precipitate be treated with solution of ammonia, the clear ammoniacal liquid should yield no precipitate when an excess of nitric acid is added. If less than 14.1 grains of the yellow precipitate is obtained, and a white precipitate falls on the addition of nitric acid as above, chloride of potassium or sodium has been present. If the precipitate by nitric acid becomes yellowish by washing, bromide of potassium was probably present. When bromide of potassium exists as an adulteration it may be detected thus: to a solution of the suspected iodide add an excess of sulphate of copper, and pass a current of sulphurous acid through the solution till it ceases to cause a precipitate of protiodide of copper; filter the liquor from the iodide of copper, add chlorine water and ether and agitate the mixture. If bromide of either potassium or sodium was present, the supernatant ether in the test tube will be colored reddish yellow. By then washing, drying and weighing the iodide of copper, the amount of iodine, and from this, of iodide of potassium present, can easily be ascertained by calculation, as 10 grs. of pure iodide of potassium should yield nearly 11.5 grs. of iodide of copper.

When nitrate of soda, nitrate of potassa, or other salt not acted of by nitrate of silver or ammonia, is present, the fact will be indicated by the iodide of silver test above, not indicating the full amount of iodide, and no precipitate being yielded by nitric acid from the ammoniacal washings of the iodide. Water may exist to the extent of several per cent, especially if carbonate of potassa

be present. Bromide of potassium produces no precipitate with bichloride of mercury which will indicate this salt when sold as iodide.

BITARTRATE OF POTASSA. *Cream of Tartar.*—Bitartrate of potassa has been adulterated with *chalk, tartrate of lime, quartz sand, clay, saltpetre, alum, sulphate of potassa, chloride of potassium, flour*, and perhaps other substances. Commercial cream of tartar generally contains a little tartrate of lime not intended as an adulteration. When pure, cream of tartar is soluble in 184 parts of cold and 18 of boiling water, and is insoluble in alcohol. When, therefore, five grains of it is agitated with two fluid ounces of distilled water, there will be a slight crystalline residue after time enough has elapsed to saturate the water, if the salt is pure. If the solution is complete and quickly effected, the presence of a more soluble salt may be suspected, if an opaque residue is left, one or more of the insoluble adulterations are present. Any sulphate present may be detected by adding nitrate of baryta to the aqueous solution of the suspected cream of tartar, and treating the precipitate with nitric acid, when an insoluble sulphate of baryta remains. Chloride of potassium is detected by nitrate of silver which produces a white flocculent precipitate insoluble in nitric acid. Any insoluble matter will be left when the salt is heated in 20 parts of water to ebullition, and under such circumstances flour, if present, will be indicated by iodine which colors the liquid blue.

NITRATE OF POTASSA.—Saltpetre has been adulterated with *sulphate of potassa, chloride of sodium, and nitrate of soda.*—Sulphates are detected by nitrate of baryta, which precipitates sulphate of baryta insoluble in nitric acid. Chloride of sodium and potassium are indicated by nitrate of silver, which forms with them chloride of silver insoluble in nitric acid and soluble in solution of ammonia. To prove the purity of the nitrate from nitrate of soda, weigh 100 grains, add to it 60 grains of sulphuric acid in a deep platina or porcelain crucible covered to prevent loss during the desiccation of the salt, and keep it at a red heat till it ceases to lose weight. The residue should weigh 86 grains. If less than this, and chlorides and sulphates are absent, the saltpetre probably contains nitrate of soda.

Bicarbonate of Soda.—Bicarbonate of soda is extensively used both in medicine and for culinary purposes in connection with tar-

taric acid or cream of tartar as an agent for raising bread and cakes. Its most usual impurity is *carbonate of soda*, arising from the imperfect saturation with carbonic acid. When present, the carbonate gives a decided alkaline, disagreeable taste, and if in the amount of one to three per cent, will afford a white precipitate by sulphate of magnesia, and a reddish brown one by corrosive sublimate. Heated to redness for fifteen minutes it loses 37 per cent, and when decomposed with sulphuric acid in a flask, it should lose about half its weight of carbonic acid. Sulphate of soda may get in this salt by using a carbonate contaminated with that salt in making the bicarbonate of soda. It is indicated by nitrate of baryta yielding a precipitate insoluble in nitric acid. Chlorides are detected by nitrate of silver. The great cheapness of bicarbonate of soda is one reason that it is less adulterated than many others, as no salt not detected by taste or insolubility is sufficiently cheap to use for this purpose.

Carbonate of Soda.—Carbonate of soda when designed for medical use, should be examined as to its quality. When intended for the physician it is best to select the well defined flat rhombic crystals, which are more certainly pure than the irregular masses.—When sulphate of soda and chloride of sodium are present, (they are the most usual impurities,) they are indicated by dissolving the carbonate in pure diluted nitric acid to saturation, and adding nitrate of baryta or nitrate of silver. As carbonate of soda contains 63 per cent of water which it partially loses with great readiness by efflorescence, attention should be given to this fact in using it in chemical recipes, and in prescriptions.

W. P., JR.

THE PHARMACOPŒIA OF THE KING AND QUEEN'S COLLEGE OF PHYSICIANS, IN IRELAND, 1850. Dublin: Hodges & Smith, Grafton Street, Booksellers to the University. pp. 191, octavo.

The last edition of the Dublin Pharmacopœia was published in 1826. Three years ago the College of Physicians, of Ireland, deeming it proper that the work should be revised and brought up to the present state of Materia Medica and Pharmacy, commenced

its revision, and have pursued it steadily until their labors were complete in the publication of the volume before us.

The most obvious change, which at once strikes the reader, is the abandonment of the Latin, except in the *Materia Medica* list and the names of preparations; in which course it has followed the *Edinburgh Pharmacopœia*, and both of them the *United States Pharmacopœia*, which was the first work of the kind published by authority in English.

In glancing over the list of the *Materia Medica* we are reminded that we are not looking in our own Code, by the want of simplicity in the nomenclature. The botanical names of plants in many instances are placed in the list precisely on a par with shorter officinal names for the part used. Thus, "*ARCTOSTAPHYLOS UVA URSI*" is translated "*Bearberry. The leaves*;" whilst further on we find "*UVA URSI*," which is referred to "*Arctostaphylos*."

"*COLCHICUM AUTUMNALE*" is the designation for the "*cormus and seeds*" of the plant. The tincture is called "*Tinctura Seminum Colchici*."

"*SUCCINUM. Amber. The oil obtained by its destructive distillation.*" Why not at once call it *Oleum Succini*? "*R. Succini*" will mean "*Take of Oil of Amber*," or *Take of Amber*, and lead to confusion. Rectified oil of Amber is not mentioned.

We will not occupy space, however, in pointing out the peculiarities of the *List*; after all, it is greatly a matter of opinion. We think a simple nomenclature facilitates the prescriber's office, is more easily remembered, and is less likely to cause errors; and, moreover, is much more harmonious to the ear and eye. The revisors have adopted the botanical names for plants given in *Lindley's Medical and Economical Botany*," giving also his authorities.

As regards the correctness of these references we have not had time to be critical, nor do the revisors appear to have given any great amount of attention to this department of the work. There is a want of uniformity in the phraseology of the formulæ, and a wide departure from the former brevity of the Latin, in many instances. We think the latter an improvement, because it renders the meaning of the directions clearer and less liable to be misunderstood. The affix "*of Commerce*" is frequently applied, and is intended to point out the distinction between the purer prepara-

tion of the pharmacopœia, and the ordinary commercial article. In no instance has the English translation of the Latin name of a preparation been directly given; and it is only when one preparation is used in forming another that we can get at the rendering. The nomenclature of the preparations has been greatly simplified, and in our opinion improved, in the present edition. We do not find a single note of test directions in the book, either attached to the chemical articles in the *Materia Medica* list, or to those among the preparations. It may be that the revisors deem a commentary a fitter place for these useful directions, than the *Pharmacopœia* itself; but we decidedly prefer to have them in the latter.

WEIGHTS AND MEASURES.—Perhaps the most radical change which will be found in this work has reference to the system of weights. The entire troy standard has been dropped, with the exception of the *grain*, and the avoirdupois pound and ounce adopted. The ounce is sub-divided into *eight* parts called drachms, the *drachm* into *three* scruples, each of which is valued at 18.22 grs. troy. By this change the weights for buying selling and mixing are the same, and one fruitful source of error in compounding done away—assuming that the new system is adopted in practice. Nothing is more usual than to find beginners, and often the more experienced, confounding the troy and avoirdupois weight in weighing the lesser and greater quantities in officinal formulæ and even in prescriptions.

The Imperial gallon and its divisions down to the minim have been adopted, so that in fluid measures the three British Codes are alike. As the imperial gallon contains exactly 160 avoirdupois ounces, and as it contains also 160 fluid ounces, it follows that there is a common relation between the weights and measures. This affords a means of arriving at the weight of any measure of liquid of known specific gravity, as all that is necessary is to multiply the measure by the specific gravity, to get the weight of the liquid. Thus, 11.5 fluid ounces of proof spirit weighs $11.5 \times .92 = 10.88$ ounces avoirdupois. The innovation not extending to the grain weights, renders the drachm and scruple “not multiples of a grain by integer numbers,” hence the minim and grain have a different signification, the minim of water weighing $\frac{91}{1000}$ gr.

In order to obviate, as far as possible, the inconvenience of a sudden change of weights in the pharmacy of Ireland, Mr. Dono-

van, of Dublin, has undertaken to supply, at a moderate cost, the Apothecaries' officinal weights.

Abstractly we are by no means inimical to this change in the system of weights—it is a return to the old system, prior to 1720, and which never should have been forsaken; and in a country like Ireland, we see no reason why its adoption should not be practicable; at the same time we doubt the policy of the change in view of the continued use of the Troy standard in the other British and the United States Pharmacopœias.

The classification of the preparations has been altered in many respects. Salts are placed under their generic names instead of that of their metallic bases, except the Chlorides, Iodides, and the Alkaloid Salts, the whole being arranged in an alphabetical order; thus: *Acetates, Acids, Alkaloids* and their salts, *Arsenites, Carbonates, Chlorine* and its metallic compounds, *Citrates, Clysters, Confections, Decoctions, Ethers, Extracts, &c., &c.*, the headings of each class being in English terms.

We will now run over the preparations, and note some of the novelties that may present.

Solution of sub-acetate of Lead.—This preparation is made from acetate of lead and litharge, as in our own Pharmacopœia; but is rather more than one half the strength of our solution. The diluted solution, or lead water, is about the strength of the United States preparation.

Acetate of Zinc is prepared from acetate of lead and metallic zinc, as in the U. S. P.

Acidum Aceticum Glaciale is prepared from acetate of lead, dried at 300° F., and muriatic acid gas; and not from acetate of potassa as before. The powdered kiln-dried acetate contained in a flask, is exposed in an atmosphere of the acid gas until the acetic acid is displaced, (which is known by the general dampness of the acetate,) when the flask is attached to a Liebig's condenser, and by means of a chloride of zinc bath, the acetic acid is distilled over.

Acidum Aceticum forte is made with 6 parts of the preceding acid, and 4 parts of distilled water.

Acidum Aceticum e ligno venale has been placed in the List, and means the commercial (No. 8) acetic acid. This is used in making the *diluted acetic acid*.

Acidum Benzoicum is prepared by Mohr's process.

Acidum Gallicum has been introduced, and two processes given for its preparation. The first by atmospheric action on moistened powdered galls, the other by the action of sulphuric acid on a strong infusion of galls.

Acidum Hydrocyanicum Dilutum.—This acid is directed to be prepared by mixing two ounces of ferrocyanide of potassium dissolved in 8 ounces of water, with one fluid ounce of oil of vitriol diluted with four ounces of water, and the mixture distilled from a retort or matrass, using a Liebig's condenser, until eight ounces be distilled over. The distillate is then diluted with as much distilled water as will make the whole measure sixteen fluid ounces. The specific gravity of the product is said to be .997.

We consider this formula decidedly faulty, and calculated to yield a product of uncertain strength. No water is placed in the receiver to absorb the first vapors, rich in hydrocyanic acid, and which, if the apparatus is not very tight, and the refrigeration very complete, will be lost. No check is given to regulate the strength of the final product, it being assumed that the first eight ounces will always contain the same amount of real acid. Specific gravity, where the liquid varies only .003 from the standard of comparison, is too uncertain a criterion, and we are surprised that the saturating power of the acid in reference to nitrate of silver, should have been omitted. The uncertainty of this process has been practically illustrated in the *Pharmaceutical Journal*, November, 1850.

Acidum Nitricum Purum.—The strength of this acid is 1.5.

Morphia is prepared by Gregory & Robertson's process.

Acetate of Morphia.—Alcohol is substituted for water in this formulæ. We presume the object is to effect the evaporation with less injury to the salt.

Morphia Acetatis Liquor contains $4\frac{1}{16}$ grs. to a fluid ounce of weak spirit.

Morphiæ Murialis Liquor contains $4\frac{1}{4}$ grs. to a fluid ounce of weak spirit.

Quinæ Murias is officinal, and made by double decomposition between sulphate of quinia and chloride of barium.

Strychniæ Murias has been introduced.

Ferri Carbonas Saccharatum has been introduced from the Edinburgh Pharmacopœia.

Magnesia Carbonas Ponderosum is officinal.

Sodæ Bicarbonas, is prepared in the old way by passing a current of carbonic acid into a solution of the carbonate.

Zinci Carbonas is prepared by double decomposition between chloride of zinc and carbonate of soda.

Culcis Chlorinatae Liquor is a solution of half-a-pound (av.) of chlorinated lime in half-a-gallon (imp.) of water.

Calomelas is the name for calomel.

Sublimatum Corrosivum is the name for corrosive sublimate.

Zinci Chloridi Liquor is a solution of the salt of sp. gr. 1.593.

Decoctions.—In these preparations the quantities, with six exceptions, are but half a pint, and with two exceptions the length of the ebullition is but ten minutes. This is a decided change for the better. If time is expended on these preparations, it would be better to precede a short period of ebullition by cold maceration.

Ether Sulphuricus.—In this formula quick lime is used instead of caustic potassa, in freeing the product from sulphurous acid, previous to its rectification.

Spiritus Ethereus Oleosus.—Under this name Hoffman's anodyne is known in the new code. In the Pharm. 1826 the process for its preparation was exceedingly defective—it merely directed the residue left in making sulphuric ether to be distilled until a black froth commenced to rise in the retort without any subsequent treatment of the distillate. In the formula of 1850, a pint of rectified spirit is acted upon in a retort with a pint and a half of sulphuric acid until the rising of the black froth renders it necessary to stop the distillation; the distillate is exposed for twenty four hours till the ether has evaporated, when it is washed with a little water and introduced into a bottle containing 10 fluid ounces of alcohol, and 5 fluid ounces of ether. This process is therefore a combination of those for oil of wine and compound spirit of sulphuric ether, and is a great improvement on the one of 1826.

Extractum Aloës Aquosum, is a useless preparation made by boiling hepatic aloes in 10 parts of water till dissolved, except the dregs, and evaporating.

Extractum Cannabis Indicæ Purificatum is an alcoholic extract of an alcoholic extract! If the substance treated was ever good, the

treatment does not improve it, and if bad it does not render it better, unless it has been adulterated. These two processes recall to mind the often quoted epigram :

“The king of France, with twenty thousand men,
Sailed up the Scheldt—and then sailed down again.”

Extractum Colchici Aceticum is directed to be made by digesting four ounces of the dried root in eight fluid ounces of diluted acetic acid for fourteen days, then filter and evaporate to a soft extract by means of a water-bath ! We have strong doubts whether the extract would be forthcoming by this treatment, as 4 oz. of colchicum root will, if we mistake not, retain nearly the whole menstruum by imbibition, and no direction is given to express, or to displace.

Extractum Rhei, is made with six parts of water, and when done is but little stronger than the root from which it was made. Diluted alcohol yields a much more efficient extract.

Extractum Sarsaparillæ Fluidum, the only fluid extract, is made by acting on the root with 8 parts of water at 212° in two successive operations, evaporating to a thin syrup and adding q. s. rectified spirit to make it measure Oj. (Imp.) What will our American apothecaries think of this ? Our Irish brethren do not seem to understand the constitution of sarsaparilla, or its relation to solvents, else they would have directed an alcoholic menstruum.

Infusions.—The average time of maceration in these preparations has very properly been abridged, none of them requiring more than one hour. Among them we notice as new :—

Infusum Ergotæ ; two drachms to nine ounces.

Infusum Matico ; half an ounce to ten ounces, &c.

Infusum Polygalæ ; instead of Decoctum Senegæ.

Iodinium Purum.—Commercial iodine is directed to be purified thus :—“Introduce it into a deep porcelain capsule of a circular shape, and having covered this as accurately as possible with a glass matrass filled with cold water, apply to the capsule a water heat for the space of twenty minutes, and then, withdrawing the heat, permit the capsule to cool. Should the sublimate attached to the bottom of the matrass include acicular prisms of a white color and pungent odor, let it be scraped off with a glass rod and rejected. The matrass being now returned to its previous position, a gentle and steady heat (that of a gas lamp answers well) is to be applied, so as to sublime the entire of the iodine. Upon now

lifting off the matrass the purified product will be found attached to its bottom. When separated, it should be immediately enclosed in a bottle furnished with an accurately ground stopper."

We presume the first sublimation is intended to detect and remove any iodide of cyanogen which may happen to be present.

Arsenici et Hydrargyri Hydriodatis Liquor, or Donovan's solution, is made directly from its elements by the published process of Mr. Donovan. We prefer to make it from the iodides of arsenic and mercury, previously prepared.

Hydrargyri Iodidum Viride ; means protiodide of mercury.

Potassii Iodidi Liquor Compositus, means a solution of five grains of iodine and ten grs. of iodide of potassium in a pint of distilled water.

Linimentum Cantharidis, is made by digesting three ounces of powdered cantharides, in twelve fluid ounces of olive oil for three hours, then expressing and straining.

Linimentum Crotonis, is a mixture of a fluid ounce of croton oil with seven fluid ounces of oil of turpentine.

Arsenicum Purum, indicates metallic arsenic. The following process is given for its preparation. Take of white oxide of arsenic two drachms. Place the oxide at the sealed end of a hard German glass tube of about half an inch in diameter and eighteen inches long, and, having covered it with about eight inches of dry and coarsely pulverised charcoal, and raised the portion of the tube containing the charcoal to a red heat, let a few ignited coals be placed beneath the oxide so as to effect its slow sublimation. When this has been accomplished the metallic arsenic will be found attached to the interior of the tube at its distant or cool extremity."

Directions are given for preventing the stoppage of the tube, by the accumulation of the sublimate, (with an iron wire,) and for avoiding the fumes.

Ferri Pulvis, means iron reduced by hydrogen, and for which a formula is given; a gun barrel is used as the reduction tube.

Hydrargyri Pernitratiss Liquor.—Under this name the acid nitrate of mercury solution, of the hospitals, is intended.

It is directed to be made by dissolving two ounces of mercury in a fluid ounce and a half of nitric acid (sp. gr. 1.5) diluted with

an equal bulk of water, and afterwards evaporating till the solution measures two fluid ounces and a half.

Volatile Oils, are directed to be prepared in the usual way, and the distilled water obtained with them, kept for medical use.

Adeps Suillus Præparatus is hog's lard that has been melted with twice its weight of water, and after being stirred suffered to cool, and the lard separated for use.

Unguentum Cantharidis is made with eight fluid ounces of Liment of Spanish flies, three ounces of white wax, and one ounce of spermaceti. It is a more active preparation than that of the U. S. P.

Unguentum Picis Liquidæ. In this preparation the suet has been abandoned; ten fluid ounces of tar being incorporated by fusion with four ounces of yellow wax.

Ammoniæ Liquor Fortior, is directed to be of sp. gr. .900.

Argenti Oxidum, is directed to be made with lime water; half a gallon being used to decompose half an ounce of nitrate of silver, dissolved in four ounces of water,—the precipitated oxide is afterwards washed with distilled water, dried below 212° , and preserved in a bottle—nothing is said in reference to preserving it from the light, a precaution quite necessary.

Emplastrum Ammoniæ, is ammoniac purified by solution in proof-spirit with the aid of heat, strained and evaporated to the proper consistence. The old menstruum was vinegar of squills.

Emplastrum Resinæ, contains one eighteenth of its weight of Castile soap.

Pulvis Antimonialis, is made by a new process; the old method by deflagration being totally abandoned. It is as follows:—

“Take of tartar emetic, and phosphate of soda, of each four ounces; chloride of calcium, two ounces; solution of ammonia, four fluid ounces; distilled water, one gallon, and a half, or q. s. Dissolve the tartar emetic in half a gallon, and the chloride of calcium, and phosphate of soda each in a quart of the water. Mix the solutions of the tartar emetic and phosphate of soda, when cold, and then pour in the solution of chloride of calcium. Boil now for twenty minutes, and having collected the precipitate, which will have then formed, on a calico filter, wash it with hot distilled water, until the liquid which passes through ceases to give a precipitate with a dilute solution of nitrate of silver. Finally, dry

the product by a steam or water heat, and reduce it to a fine powder.

Pulveres Effervescentes Citrati, are a kind of soda powders containing half a drachm of citric acid in one paper, and 33.4 grs. of bicarbonate of soda, or 39.4 grs. of bicarbonate of potassa in the other paper. A corresponding preparation with tartaric acid is also directed.

Pulvis Rhei Compositus, is a mixture of two parts of rhubarb, six of magnesia and one of ginger. It is a good preparation, and adopted from the Edinburgh Pharmacopœia.

Alcohol, signifies alcohol sp. gr. .795, and prepared by distilling 16 parts of alcohol of sp. gr. .818, with 10 parts of quick lime, rejecting the first ninth of the distillate. The process is like that of the Edinburgh Pharmacopœia.

Spiritus Fortior, is alcohol of sp. gr. .818.

Spiritus Tenuior, is proof spirit (sp. gr. .920.)

Essences.—Under this head we find a class of preparations consisting of volatile oils dissolved in alcohol, and about the strength of our tincture of oil of peppermint. These are substituted for the distilled spirits. They are employed pharmaceutically for preparing the aromatic waters, and for aromatising mixtures. We believe that such preparations are much more efficient and uniform in strength than the distilled spirits, and although they are liable to the objection, that it is not always possible to get the volatile oils pure and in good condition, yet even this objection will not counterbalance the advantages they present when made in this way.

Antimonii Sulphuretum Præcipitatum, is made by fusing black sulphuret of antimony and dried carbonate of potassa, boiling the resulting mass, previously reduced to powder, in water, and filtering the solution into diluted sulphuric acid; the precipitate being subsequently washed and dried.

Syrupus Acid Citrici, is simple syrup, containing six drachms and two thirds of citric acid to the pint, flavored with tincture of lemon peel.

Syrupus Ferri Iodidi, contains but 34.16 grs. of the Iodide per fluid ounce, whilst our preparation has 48 grains in the same bulk.

Syrupus Hemidesmi, is a syrup of the root of *Hemidesmus Indicus* or Indian Sarsaparilla.

Syrupus Morphia Acetatis, and *Syrupus Morphia Muriatis* are solutions of the respective salts in simple syrup, $\frac{1}{4}$ of a grain per fluid ounce.

Tinctura Cannabis Indicæ, is made by dissolving half an ounce of purified extract of Indian hemp, in half a pint of alcohol.

Tinctura Cinchona.—All of the pharmaceutical preparations of cinchona, except quinia and its salts, are prepared with crown or pale bark. We are accustomed to view this species as so inferior in medicinal power, that it is a matter of surprise that it should be the only one employed in the galenical preparations of bark. There is no extract of bark officinal.

Tinctura Matico, made with 8 ounces to 2 pints is officinal.

Valerianates.—Under this head the valerianates of *iron*, *quinia*, *soda* and *zinc* are introduced. As the others are all made from the soda salt, by double decomposition with salts of the respective bases, we will give the formula for the latter in full, as it is unique.

Soda Valerianas.

Take of Bichromate of Potash, in powder, nine ounces.

Fusel oil, four fluid ounces.

Oil of Vitriol of Commerce, six fluid ounces and a half.

Water, half a gallon.

Solution of Caustic Soda, one pint, or as much as may be sufficient.

Dilute the oil of vitriol with ten ounces, and dissolve with the aid of heat, the bichromate of potash, in the remainder of the water. When both solutions have cooled down to nearly the temperature of the atmosphere, place them in a matrass, and, having added the fusel oil, mix well by repeated shaking, until the temperature of the mixture, which at first rises to 190° , has fallen to 80° or 90° . The matrass having been now connected with a condenser, heat is to be applied so as to distil over, about half a gallon of liquid. Let this, when exactly saturated with the solution of caustic soda, be separated from a little oil that floats on its surface, and evaporated down until the escape of aqueous vapor having entirely ceased, the residual salt is partially liquified. The heat should now be withdrawn, and when the valerianate of soda has concreted, it is, while still warm, to be divided into fragments, and preserved in a well stopped bottle."

In this process valerianic acid is formed by the oxidizing action

of chromic acid on the fusel oil, and becomes valerianate of soda when saturated with the solution of caustic soda and evaporated. The *fusel oil* used for this transformation will be noticed presently.

Acetum Colchici, is of the same colchicum strength as ours, but the menstruum contains twice as much real acetic acid.

Medicated Waters, are made by agitating a fluid ounce of essence (of Anise for example) with half a gallon of distilled water, and filtering; except in two instances. Cherry laurel water is distilled from the leaves, and Rose water is made by agitating 20 drops of oil of roses with half a gallon of distilled water. It is remarkable, in view of the well known property of magnesia and other insoluble powders, in facilitating the solubility of volatile oils, that the revisors of this work should not have adopted that method.

Wines.—But three of these are officinal, those of ipecac, opium, and rhubarb.

In a short supplement we find the following :—

Alcohol Amylicum—Fusel Oil.—Take of the light liquid, which may be obtained at any large distillery by continuing the distillation some time after the pure spirit has been all drawn off, any quantity.

Introduce it into a small still or retort connected with a condenser, and apply heat so as to cause distillation; as soon as the oil begins to come over unmixed with water, the receiver should be changed, and the distillation being resumed and carried nearly to dryness, the desired product will be obtained."

We give this formula as a sequel to the one for valerianate of soda.

Chloroform.—The only peculiarities noticed in this formula are the use of quick lime to the extent of half the weight of the chlorinated lime employed, and the rectification of the chloroform, after agitation with sulphuric acid, from a little peroxide of manganese.

Elaterium.—A formula for its preparation is given.

Soda Causticæ Liquor, is a solution of caustic soda, sp. gr. 1.056.

REPORT OF THE COMMITTEE ON ADULTERATIONS AND SOPHISTICATIONS OF DRUGS, MEDICINES, CHEMICALS, &c. Presented to the American Medical Association at its Third Annual Meeting, held in Cincinnati, May, 1850. Philadelphia, 1850. pp. 20.

Most of our readers are perhaps aware that for several years past the great interests of Medicine have been represented by Annual Meetings of delegates from the regularly organized medical societies and institutions in all parts of our country, under the name of the "American Medical Association." This numerous and respectable body vary their place of meeting among the chief cities of the Union; the last meeting having been held in Cincinnati, and it adjourned to meet in Charleston, S. C., in May next. The business of these meetings is conducted through committees, who are appointed at one session and report at the next. The pamphlet before us is the report of the Committee on Adulterations, &c., by Dr. Robert M. Huston, Chairman. We felt some interest to know who were the persons to whom this important subject, so closely affecting our interests as pharmacutists, had been committed, but we looked in vain over the pages of the Report, for a list of the Committee. We find that "to Drs. Jackson and Bowditch of Boston; Reyburn and Johnston of St. Louis; Frost, of Charleston, and Upshur, of Norfolk, especially, the Association is largely indebted for their zealous efforts in the prosecution of these inquiries. It is a subject of regret, however, to the Chairman of the Committee, that most of their reports came into his possession at a period too late to do justice to their authors or to the subject." It would perhaps have been unjust to the other members of the Committee to have given them credit for labor they did not perform.

Dr. Huston has considered the subject under the distinct heads of foreign and domestic adulterations. In reference to foreign importations he considers the operation of the drug Inspectors under the Law has been decidedly beneficial, the quality of importations being improved, and the amount of rejected drugs greatly reduced. As was anticipated, the working of the Law has not been without inconvenience to some of those concerned, whose aim is perfectly just and honourable. We allude to the Manufacturing Chemists; and these gentlemen, we think, have just cause to complain of the present working of the Inspection. The importance of fostering

and encouraging chemical manufactures, needs no word of ours to declare it, whether viewed in a national, medical, or economical light ; and whilst we would very reluctantly advocate any modification of the Law that would open the door to the designing, we believe that a change is possible which will enable the manufacturer to import certain specified drugs, solely for manufacturing purposes, as Opium, Iodine, and Barks, of a quality below the standard.

In reference to *home adulterations*, Dr. Huston thinks they have rather decreased than increased, since the passage of the Law.

“ To determine the point, some of the physicians of Boston had an analysis made by a competent chemist, of a few drugs purchased from various druggists and apothecaries in that city. Thirteen specimens were procured from—1st, the *wholesale druggists* ; 2d, the *superior apothecaries* ; 3d, the *minor apothecaries*. The results of this examination were more favorable than could have been anticipated. Only four of the articles failed of being of the standard purity, viz : Turkey rhubarb, and bitartrate of potassa, bought of the first class ; yellow cinchona procured from the second class ; and ipecacuanha from one of the third. The rhubarb was one half, the cinchona one eighth of its proper strength ; the bitartrate contained ten parts of foreign matter, and the ipecacuanha was but one half the strength it should have been.”—*Report page 7.*

“ A member of the committee from Missouri, undertook similar investigations in the city of St. Louis, but with results less satisfactory. He analysed various samples of mercurial ointment sold there, and generally purchased in the eastern cities, and ‘*in every instance*, proved ‘*a large deficiency of mercury*,’ and he was told by reliable authority, that the ointment was sometimes prepared in St. Louis, ‘by mixing a small portion of the genuine ointment with cerate, and giving it the requisite blue shade by means of crude antimony.’ An examination of fifteen samples of blue mass, discovered great inequalities in strength, with deficiency of mercury in all. ‘One third only gave an approximation’ to the officinal proportion of the metal. ‘In some of the samples, it was evident that materials not known to the officinal formula, had been intermingled.’

“ The same gentleman ascertained that the powders of roots

and barks sold in the shops, were largely adulterated in many instances, and that of these ipecacuanha was especially inert. The roots, leaves, barks, seeds, and flowers, he found to be 'generally far inferior in quality to the same articles kept for city sale by eastern druggists.' The alkaloid's and their salts, as quinia, strychnia, morphia, &c., manifested less of intentional fraud. Nitrate of silver was of various degrees of purity, and of corresponding price. The vegetable extracts were exceedingly variable in quality and effects; and a like inferiority was noticed in the essential oils, as well as in various other articles."

We are sorry to see this additional testimony to the existence of a practice of which the druggists of the Eastern cities have been accused. Whether it arises from the disposition to buy cheap on the part of the Western drug dealer, or to *sell* cheap, or practice fraud on the side of the Eastern druggist, we do not know. Extensive observations by the chairman in Philadelphia, and some inquiry in New York, have satisfied him that adulterations are looked upon with greater disfavor, and actually less practiced than formerly. The same he believes to be true in Boston, and probably in other cities. If this be a fact, there must yet remain some black sheep to render the statement of the St. Louis member of the committee, correct and true. The practice of certain druggists of respectable character, of keeping two qualities, or strengths of galenical preparations, is alluded to with just disapproval. Articles like laudanum, nitrate of silver, and spirit of nitric ether, are weakened by dilution to suit customers. This practice, if it yet continues to exist, is certainly a great evil. Large quantities of preparations like those mentioned, are sold by country store keepers, who obtain them from druggists in the city stores. Being no judges themselves, and accustomed to buy on the cheap principle, without understanding or feeling the responsibility which should ever attach itself to the dealer in medicines, these store keepers are a fruitful source of the practice alluded to.

The report alludes to the adulterations of powdered vegetable drugs. In this item there has been a very decided improvement of late years. With Dr. Huston, we think that the present imperfections in the preparations, are more the result of powdering inferior qualities of the several drugs, than of any admixture of cheap inert matter, although this may yet be done in some instances.—

Some druggists seem to have a decided bluntness of vision when preparing drugs for the powderer, and are not careful to remove deteriorated and decayed portions, which not only have no virtue, but dilute the parts which yet retain their strength.

The report concludes with suggestions of a remedial character, which are,

1st. That state legislatures should be applied to, to appoint inspectors of drugs, and make it a penal offence to deal in adulterated drugs and medicines. The hopelessness of this suggestion is admitted by the report itself.

2d. "That physicians should feel it to be their duty to inspect the medicines in the drug stores from which they are in the habit of obtaining supplies for themselves or their patients. This would exercise a wholesome influence, if submitted to by the apothecary, and frequently performed by the physician, neither of which, however, is very probable."

Unfortunately for this proposition, the larger number of medical men are not sufficiently versed in *materia medica* and chemistry to exercise a judgment that would command the respect of the pharmacutists and druggists. As a more probable plan, Dr. Huston suggests, that the various state medical societies shall annually appoint boards of examiners, who shall procure samples of drugs, as sold within their limits, analyse, and otherwise examine them, and publish the results. We approve of this, as well as the individual action of physicians, if they proceed in the right spirit, because it would have a wholesome influence on the tempted, and would give the really enlightened and conscientious apothecary the advantage his merits deserve.

3d. The report recommends that the apothecaries be encouraged to institute associations for scientific and educational purposes, throughout the country. This suggestion, which is not new to our pages, is worthy of being seconded.

4th. Physicians are recommended, in making their purchases, to be willing to give fair prices, and to deal only with respectable druggists, who have a character at stake: an excellent suggestion, worthy of the attention of country physicians.

In conclusion we may say, that the report of Dr. Huston has impressed us favorably, and some of its recommendations are calculated, in our opinion, to exercise a healthful influence on both professions.

COPAL AND COPAL VARNISH.

On the different sorts of Copal found in the market, and on the Mode of Manufacturing Copal Varnish for certain purposes.

BY M. R. SCHINDLER.

There are three sorts of copal to be found in the market, without either of them having any other name attached, whereby to ascertain this difference, than the terms East and West India copal, the latter term including two kinds very different from each other.

As to the East India copal, called also African copal, it is softer, more colorless, and transparent than the other varieties, always having a clean surface, and emitting an agreeable odor when heated. Its form is globular, and it would be as well at once to give it the name of *globular copal*, as a distinctive mark. This is the copal which furnishes the best varnish. Old oil of turpentine has but little action on this copal; more recently-distilled turpentine dissolves it completely; but not in a larger proportion than its own weight, or the excess of copal is precipitated, Rectified turpentine, or turpentine digested with sulphur, is able to take up double its weight of this copal without any precipitation—the solution, however, at this strength, is somewhat turbid.

Oil of rosemary, thick and old, only causes the copal to swell; that which has been newly rectified, or as it is usually met with in the market, provided that it has been carefully kept, dissolves the copal in any proportion giving a clear yellowish solution, which, in the proportion of equal parts of oil and copal, remains fluid enough for use.

This kind of copal fuses much more readily than the other two. It is less volatile, and gives out no empyreumatic oil, but only some watery acid. If the operation be performed without access of air, fire carefully regulated, and the vessels so constructed as to allow the free disengagement of the liquid substances formed, this copal is not darker after than before fusion. As soon as it ceases to froth up, the fusion is complete, and then good oil of turpentine dissolves the copal in any proportion, and forms, according to the solvent used, a beautiful and good varnish for the metals, paintings, wood exposed to air, leather, &c., &c.

The second kind of copal, called West India copal, or American

copal, is imported in pieces almost always flat, and of a size scarcely exceeding three ounces in weight; it is very hard, has a rough appearance, and is without smell or taste. Its color is yellowish, and never colorless like the preceding. Insects are very rarely to be found in it. It is brought from the Antilles, Mexico, and North America.

According to Lunery it exudes, in the Antilles, from a large tree, falls into the rivulets which run along the sides of the mountains, and from thence is carried away by the rivers, and thrown upon their banks. According to this Chemist, it owes its great hardness to its remaining a long time in water. If we carefully examine the exterior of this copal, we shall find that the outer layer, which is coarse, and not transparent, bears no impression either of sand or dirt, and rarely of leaves. Its exterior appearance gives no indication of subterranean origin.

Absolute alcohol dissolves it in so small a proportion, that no advantage is derivable from a spirituous varnish, although those which are thus prepared are very hard and durable. Rectified oil of turpentine dissolves, after a long digestion, a small quantity of this copal, and, when heated for some time, the solution becomes colored; with new oil of rosemary it swells, but is not dissolved.

It fuses also with much more difficulty than the globular copal, giving off much less watery acid, but a good deal of empyreumatic oil. Fused with access of air, it becomes entirely black, unless a large vessel be employed, in which the empyreumatic oil can be readily removed. It is also blackened by repeated fusions. As soon as the copal ceases to froth up, the fusion is complete. If it has not been sufficiently fused, or if an oil of turpentine, containing too much resin, be employed for dissolving the copal, a good deal of copal settles down from the solution. Notwithstanding most minute preparations, it is difficult to prepare a varnish with this copal, free from a brown color.

The third kind of copal is imported in convex or concave pieces, weighing about half a pound each, often containing insects and vegetable substances. Its odor is aromatic, its consistence is not hard, and, when warm, it readily takes the impression of the nail. It is of the color of hard copal, and, in order to distinguish it from the latter, I give it the name of *insect copal*.

Alcohol, oil of rosemary, and oil of turpentine act upon it in the

same way as on hard copal. Its fusing point is between that of the globular and the hard copals. When in a state of fusion, it gives off less acid than the former, but much more oil (volatile as well as empyreumatic) than the latter; in other respects it resembles the hard copal. By careful treatment, a transparent varnish is obtained with it; but so soft and so slow in drying, that it would be as well altogether to reject its use in the manufacture of varnish.

To Prepare a Varnish for Coating Metals.—Digest one part of bruised copal in two parts of absolute alcohol; but as this varnish dries too quickly, it is preferable to take one part of copal, one part of oil of rosemary, and two to three parts of absolute alcohol. This gives a clear varnish, as limpid as water. It should be applied hot, and, when dry, it will be found very hard and durable.

To Prepare a Varnish for the Scales of Thermometers.—I recommend the following:—One part of copal, one part of oil of rosemary, and three parts of oil of turpentine, recently rectified or digested with sulphur. After a moderate digestion, the varnish is ready for use. This varnish dries quick, but is not so hard as the preceding, although it resists the action of the air and atmospheric influences.

For Varnishing Leather.—Especially of delicate colors, I recommend the following:—Six parts of oil of turpentine, saturated with caoutchouc, two parts of copal, and two parts of oil of rosemary. This varnish should be applied somewhat fluid, and always dried at a high temperature.

For Varnishing Furniture.—The fused copal dissolved in oil of turpentine is the most economical. If the copal has not been kept a sufficient time in a state of fusion, the varnish made with it remains soft for some time after it is dry, and afterwards peels off.—*Pharm. Jour.*, Aug. 1, 1850.

MITCHAM: ITS PHYSIC GARDENERS AND MEDICINAL PLANTS

[The following remarks on Mitcham and its products, embraces two of a series of articles now in course of publication in the Pharmaceutical Journal, from the pen of its Editor, Mr. Jacob Bell. They will be continued in our next. We hope at some future time to be able to give sketches of the American Physic Gardens conducted by the Shakers at Lebanon, N. Y.—EDITOR.]

More than 2000 years ago the physicians of Greece were supplied with herbs, of which their *Materia Medica* chiefly consisted, by a class of persons called *ρίζοτομοι* (*rhizotomi* or *root-cutters*,) who occupied themselves with the collection and sale of roots and herbs. They are mentioned by Theophrastus in connection with the *φαρμακοπωλαι* (*pharmacopolæ* or *pharmacopolists*.) Most of them were illiterate and superstitious, and ascribed magical virtues to the roots and herbs which they collected.

Among the Romans these cullers of simples were termed *herbarii* (*herbarists*,) and, if we are to believe Pliny, they were a sad set of knaves.

At the present day, and in our country, the *rhizotomi* of the Greeks and the *herbarii* of the Romans are represented by a class of persons called *simplers*, who go about the country collecting those medicinal herbs which grow wild, and the demand for which is insufficient to induce the dealers to cultivate them. The plants thus collected are sold chiefly to the *herbalists*, by whom the profession and public are supplied.

But those medicinal plants for which there is a sufficient demand, and which can be grown in this country, are cultivated in *physic gardens* or *physic grounds*, by persons called *physic gardeners* or *herb growers*.

Although the cultivation of medicinal plants is carried on in various parts of England, yet more land is employed in this way in Surrey than in any other country; and by far the greatest part of our *physic grounds* lie in the parish of Mitcham, and its neighborhood, about nine miles from London. The soil of this place is a rich black mould.

The cultivation of physical plants at Mitcham commenced about a century ago. Lyson, who wrote in 1796, says, that forty years before his time there was only a few acres employed in the cultivation of medicinal herbs in this parish; whereas, at the time he

wrote, about 250 acres (of which 100 acres were devoted to the cultivation of peppermint) were occupied by physic gardeners.

At the present time more than 800 acres are devoted to the cultivation of medicinal herbs, at Mitcham, Merton and Carshalton.

About 1768 or 1769, Mr. Potter began the cultivation of physic plants at Mitcham. He was succeeded by his relative, Mr. James Moore, who furnished Mr Malcolm with the information contained in his work relating to the medicinal plants cultivated at Mitcham.

The following are the names of the principal growers at the present time: with the number of acres of land each person has under cultivation, and the number of stills in use.

Grower's Names.	No. of Acres.	No. of Stills.
Mr. Moore - - - -	350 - - - -	5
" Arthur - - - -	300 - - - -	3
" Martin - - - -	40 - - - -	3 (not much used.)
" Newman - - - -	40 - - - -	1
" Sprules - - - -	50 - - - -	2
" Weston - - - -	40 - - - -	0
	<hr/> 820	<hr/> 14

Several other growers cultivate a few acres of land.

A considerable number of medicinal plants are cultivated at Mitcham. Among the most important of these may be mentioned *aconite*, *chamomiles*, *belladonna*, *elaterium*, *liquorice*, *henbane*, *lavender*, *spearmint*, *peppermint*, *roses*, *poppies*, *savine*, *violets*, *angelica*, *stinking orache*, *caraway*, *foxglove*, *lovage*, *elecampane*, *marshmallow*, and *hemlock*. The principal part of the growers cultivate only peppermint and lavender, and some a few chamomiles. Mr. Arthur grows rather a larger number of plants than any other.

We propose occasionally to notice a few of the more interesting of the physical herbs cultivated at Mitcham, beginning with chamomiles and lavender.

I. CHAMOMILES.

1. *Varieties*.—There are two well-known sorts or varieties of the officinal chamomile (*Anthemis nobilis*, Linn.) cultivated at Mitcham, one called the *single chamomile* (*chamomelum flore sim-*

plici;) the other termed the *double chamomile* (*chamomelum flore pleno vel flore multiplici*.)

In the normal or original state, the flower, which is a composite one, has one row of white female ligulate florets, encircling a disc of yellow hermaphrodite tubular florets; and in this state the flower is said to be *single*. But the yellow hermaphrodite tubular florets have a strong tendency to become converted into the white female ligulate ones. Now, when only a few of the yellow florets have undergone this change, the flowers are still called *single*; but when all or most of them have suffered this conversion, they are then termed *double flowers*. It is obvious, therefore, that the terms "single" and "double" are, to a certain extent, arbitrary. Flowers with a single ring of ligulate florets are certainly single, while those which have no tubular florets are decidedly double. But between these extremes there are all gradations.

The change is irregular, and occurs to a greater or less extent in the same plant. At the commencement of the season a few flowers, single or nearly so, are found on plants, which at a later period of the year, yield only double flowers. The result apparently depends in part upon the mode of cultivation, which is conducted habitually without reference to this particular object, and in part probably, on other less obvious influences.

It is generally stated that the single flowers are more odoriferous, and yield a larger proportion of volatile oil.

Lewis observes of chamomiles, that "As their active matter is almost wholly confined to the yellow disc, and as the single have large discs, but the double very small ones, and when very double scarcely any at all; it is plain that the latter cannot be equivalent to the former, unless taken in much greater quantity; and, therefore, the single or large-disced flowers alone ought to be employed for medicinal uses."

The double flowers, however, are much more showy, and hence are preferred by the public; double flowers being much more admired in floriculture than single ones. Hence, therefore in Chemists' and Druggists' shops the double sort is usually found; whereas at Apothecaries' Hall the single sort is exclusively purchased and sold.

We find it stated by Malcolm in 1805, and by Stephenson in 1809, that the single sort is almost exclusively sold to Apotheca-

ries' Hall, while the double sort finds a ready sale at the Chemists' and physic shops.

On inquiry we find that the Apothecaries' Company still exclusively keep the single sort, believing it to be the one intended by the College of Physicians. The Company purchase it of Mr. Moore.

It is very desirable to ascertain by direct experiment the actual quantity of oil yielded by single and double flowers respectively; and we should be glad to receive from any of our readers the results of their experience on this point. Mr. Brande states, that 100lbs. of dried flowers yield, upon an average, two pounds twelve ounces of oil, and three pounds four ounces of *pharmaceutical extract*. We presume this is the experience of the operators at the Hall, where single flowers only are employed.

At Mitcham two kinds of double chamomiles are distinguished, one yielding the ordinary yellowish oil, the other, which is called a new sort, a blue oil. The samples of each kind, which have been furnished us by Mr. Arthur, of Mitcham, by whom they are cultivated, are not distinguishable, except from a slight difference in the leaf, which in the new sort is more developed. The oil is generally distilled from the entire plant, not from the flowers only, as directed in the Pharmacopœia. By keeping, this blue oil* changes its color, and becomes the usual yellowish or brownish yellow color. The flowers which yield it, although fine in appearance when fresh, are liable to change color by keeping. They are therefore less adapted for sale in the market than they are for distillation.

2d. *Cultivation*.—Stevenson says that "The soil best adapted for chamomile is a dry sandy loam; the sets are planted about nine inches from each other, on beds of four feet wide, with alleys of eighteen inches between them. The culture is very similar to that of peppermint; viz. constant attention to weeding, principally with the hand; the digging of the intervals at the beginning of winter, and covering the exposed and loose roots of the plants with fresh mould."

* The *oleum chamomillæ* of continental writers is blue, and is sometimes termed *oleum chamomillæ caeruleum*. It is the produce of *Matricaria Chamomilla*, Linn.

The *oleum chamomillæ romanæ* of the same writers, is the produce of *Anthemis nobilis*, Linn.

Mr. Arthur informs us that chamomiles may be cultivated from seed, which plan is adopted for the introduction of a fresh variety from another locality, or by way of occasionally renewing the stock. But the plan commercially pursued is that of dividing the roots, each root forming the rudiments of three or four dozen plants. Mr. Arthur plants them in rows a yard apart, with an interval of eighteen inches between the plants. If planted closer the space is not sufficient for gathering the crops without treading on the plants. At the close of the season, a sufficient number of plants are preserved to furnish the roots for the ensuing season, and the remainder are destroyed.

March is the best month for planting; but they are sometimes planted in April, and occasionally in the Autumn.

The crop is in perfection about July, and continues to yield more or less until September, and sometimes as late as October. The period, however, varies according to the season.

Either extreme of wet or dry weather is injurious to chamomiles. A soaking shower about once a week, with intervals of sunshine is the most favorable weather.

Mr. Arthur says that chamomiles are most productive when grown in a heavy soil. A stiffish black loam suits them better than a light sandy soil, which latter causes them to become weak, or than clay which is too heavy. They are benefitted by changing the ground every two or three years. They require but little manure. If over-manured, they run to stem and leaf, and the crop of flowers is less abundant.

When gathered, the flowers are placed on canvass trays in a drying closet, warmed by means of a cockle. They remain there about a day, which time is generally found sufficient.

The average crop per acre is six cwt., but the range is from three to ten cwt. The single flowers are by weight more productive than the double; but the price being lower, the value of the crop is about the same.

The flowers supplied to the English market are grown chiefly at Mitcham and in Derbyshire. Both kinds are of good quality, but we think a preference is generally given to Mitcham flowers.

The gathering costs from three farthings to one penny per pound. The cost of gathering and drying chamomiles is about 42s. per cwt.

The London Market is chiefly supplied with chamomiles from Mitcham. The following according to Mr. Squire, are the quantities supplied to the principal dealers in London :

<i>From Mitcham.</i>		<i>From other places in the vicinity of London.</i>	<i>Total.</i>
Average of three years, 1840-41-42.	Average of three years 1843-44-45.	Average of three years, 1843-44-45.	Average of three years, 1843-44-45.
12 tons.	4 tons.	16 cwt.	4 tons 16 cwt.

II. LAVENDER.

One species of Lavender only is cultivated at Mitcham, namely, common or garden lavender, the *Lavendula vera*, D. C. The spike lavender, *Lavendula spica*, D. C., is not cultivated there.

Lavender is cultivated by dividing the roots, each of which forms the rudiments of three or four new plants. These are planted in rows about 18 inches apart, with the same interval between the plants. The second year, each alternate plant is removed to leave room for those which remain. It is common to renew the plantation after the second year ; but Mr. Arthur who has given much attention to this subject at Mitcham, has succeeded in preserving the same plantation during five or six years.

Lavender is liable to a disease when too thickly planted. This occurs chiefly in the middle of the plantation, and appears to result from the aroma of the flowers, which in excess has a poisonous influence on the plants. By thinning the plantation, and ensuring a free current of air, this influence is prevented or retarded. The disease is rarely if ever met with in gardens, where single plants are cultivated. Lavender does not require a very rich soil.

A good deal of oil of lavender is drawn at Mitcham. The capacity of the stills varies from 700 to 1000 gallons. The lavender packed in bundles called *mats* (about 1 *cwt.* each) is carried to the still-house. A 1000 gallon still holds from twenty to twenty-four mats of lavender. The mat or covering of the bundles is not put into the still with the herb.

The flowers are put into the still with the stalks as cut from the ground. It takes about two hours to get the steam up ; then the

finest oil is drawn for two and a half hours—that which comes afterwards is second or third quality. The oil from the stalk is not so volatile as the other, and comes last.

III. WILD OR SQUIRTING CUCUMBER.

We know of but two places in England where the wild cucumber (*Mormordica Elaterium*, Linn.) is cultivated for commercial purposes; these are Mitcham in Surrey, and Ampthill, in Bedfordshire. The London market is chiefly supplied from the former place.

This plant is a native of the south of Europe, but flourishes well by cultivation in this country. It is essentially an annual; but Mr. Arthur, of Mitcham, assures us that if the roots be covered up during the winter, the plants survive through several seasons, and he has now some which have lived three or four years. So that it would appear that, if carefully protected from the winter cold, its life is prolonged, and from an annual the plant becomes a perennial.

The seeds are usually sown about March, and the seedlings planted out about June. A considerable number of the Mitcham plants are self sown. When they grow very large and free, the stems become extraordinarily broad and flat. We have now one before us, whose stem, as it issues from the earth, is round, and about as thick as the forefinger; but it gradually becomes flat and larger, until at its broadest part it is nearly four inches wide and half an inch thick.

A wet season is injurious to the fructification of this plant; and the present season, we are informed, has been a bad one at Mitcham.

The only part of the plant which is of use is the fruit, which, as is well known, is remarkable for bursting when ripe, and expelling its seeds with a portion of its juice with great violence to a considerable distance (some say as far as eighteen or twenty yards,) whence the name of the plant—the *squirting* cucumber. The fruits, which have arrived at maturity are of a yellowish green color; and the slightest touch at this period will disengage the fruit from its footstalk, and cause the violent expulsion of the seeds. It is, in fact, dangerous to walk among the plants at this period; for painful irritation of the eyes is sometimes produced by the contact of the juice with the conjunctiva.

The cultivators of the plant, at Mitcham, sell the cucumbers by the bushel. Each bushel contains 40lbs., and the price ranges from 7s. to 10s. Forty-five years ago the price charged to the Apothecaries' Company was only 2s. the bushel. In 1820 Dr. Clutterbuck states that half a bushel of the fruits cost half a guinea in the market.

Elaterium is manufactured from the cucumbers in London, at Mitcham, and at Ampthill. At the time (September 3d) of our visit, this year, to the Mitcham physic gardens, the manufacture of elaterium had scarcely commenced. Some of the fruits had been gathered; but the chief manufacture of elaterium was expected to commence about the 9th or 10th of September. The plants, at the time of our visit, bore numerous fruits and were still flowering.

The manufacture of elaterium, as practiced at Mitcham, may be divided into four stages or operations;—1st. Washing and slicing the fruits; 2nd. Expressing the juice; 3rd. Straining the juice and setting it aside to deposit; 4th. The collection and desiccation of the deposit called Elaterium.

1. Washing is only requisite when the fruits are dirty, not otherwise. Each fruit is sliced longitudinally, by which it is divided into halves.

2. The juice is expressed in a common screw-press. The sliced or half fruits are wrapped in a hempen cloth and then put into the press, which is screwed up with some considerable force. One of the men engaged in the manufacture of elaterium told us that he used as much force as he was capable of exerting in screwing up the press. By some, however, this powerful expression is considered objectionable, on the ground of inferior quality of elaterium which is in this way obtained.

3. The expressed juice is then strained. One manufacturer merely strains it through a kind of colander (a perforated metallic plate.) Mr. Arthur tells us that he strains it through two sieves—one a hair sieve, the other a cypress sieve. Instead of the latter a copper wire sieve, having 100 wires to the inch, may be used. The colander, above alluded to, cannot, it appears to us, be sufficient to separate the various shreds and pieces of vegetable tissue which escape from the press along with the juice. The expressed juice, as it escapes from the press, is usually received in a small

tub, and when it is full, the juice is strained. This appears to us to be an error of the Mitcham manufacturers—the juice should be strained as it runs from the press, before it has had time to deposit.

The strained juice is then set aside for the deposit to take place. At Mitcham the deposite vessels are common tubs or half barrels about eighteen inches high. This part of the process it appears to us also admits of improvement. The deposite vessels should be made either of glazed earthenware or of glass. The elaterium is deposited from the juice in a few (usually three or four) hours.

4. When the deposition of the elaterium has taken place, the supernatant liquor is carefully poured off. The deposit is then placed on calico cloths resting on hair sieves, and is there allowed to drain for about twelve hours. The drained deposite is then removed by a knife, and spread over small cloths and dried on canvas frames in the drying stove.

By one manufacturer we were informed that he dried the elaterium on paper.

Mr. Arthur tells us that one bushel or forty pounds of fruit yield about half an ounce of fine elaterium. This agrees with the experience of Dr. Clutterbuck, who states that half a bushel yielded "less than two drachms of elaterium." Some persons, it is said, obtain as much as three-quarters of an ounce from the bushel of fruits; but probably this is effected by the use of extra pressure, by which elaterium of inferior quality is procured.

Good elaterium has a pale pea-green tint. Inferior qualities have a duller or sadder color.

We were assured at Mitcham that the juice from which elaterium has deposited is not used to obtain a second deposit, but is thrown away.

The juice which is expelled along with the seeds scarcely becomes clouded by exposure to the air, and is believed to be inert; but that obtained by pressure, from the burst fruits, does become milky, and this deposite constitutes the elaterium. It follows therefore, that recently burst fruits are nearly, if not quite, as good for making elaterium as those which have not burst.

REPORT OF AN EXPERIMENT ON FOUR BUSHELS OF CUCUMBERS.

The fruits were sliced longitudinally, the pulp and seeds care-

fully scraped out, immediately placed on a sieve, and stirred without pressure. The juice thus obtained was set aside for six or eight hours, and yielded $7\frac{1}{2}$ drachms of remarkably fine elaterium (No. 1) of pale green color, and having the strongly characteristic aroma which has been compared to that of senna or tea. The pulp and seeds were then washed in a little distilled water, subjected to gentle pressure, and on being set aside to deposit, yielded half an ounce of elaterium (No. 2) of a greyish green color, and having rather less of the fragrant odor.

The sliced cucumbers were then washed with distilled water and pressed. The deposit obtained (No. 3) amounting to an ounce. It had a dark, dirty, olive-green color, less aroma than the former products, and is apparently unfit for use.

The fracture of the three samples differs considerably; No. 1, being the most friable, brittle, and easily reduced to powder; No. 2 similar, but in a rather less degree; No. 3 is more tough and gummy in its fracture.

In order to obtain the maximum product of good elaterium, it is necessary to strain off the liquid from the pulp and seeds as quickly as possible after the cucumbers are cut. The deposit speedily takes place on exposure of the juice to the air, and unless the above precaution be taken, a portion of it is likely to be left in the sieve with the pulp; or, if afterwards obtained by washing, it is more or less contaminated with the inert constituents of the pulp.

IV. ROSES.

Two sorts of roses are cultivated at Mitcham, namely, one known there as the *Damask Rose*, and which Dr. Pereira states to be the *Rosa gallica*, var. δ *officinalis*, De Candolle; and the second called at Mitcham the *Provence* or *Cabbage Rose*, and which, according to Dr. Pereira, is the *Rosa centifolia*, var. *a. vulgaris foliacea*, De Candolle.

Mr. Moore (1805) states that:—

“The ground is prepared in the same manner as for lavender and liquorice, and the roses planted three feet asunder, are kept well cleaned and hoed, and in the autumn all the superfluous and dead shoots are cut out, and the ground dug between them. Every other year they are refreshed with twenty-four loads of spit dung pointed in between them, and close to the roots.”

"Mr. Moore has about seven acres of the Damask Rose and three of the Provence or Cabbage Rose, of each of which he plants a few every year to keep up a succession in high order."

The following is the mode of cultivation as now practiced by Mr. Arthur:—

1. the Damask or French Rose—*Rosa Gallica*, var. *8 officinalis* De Cand.

These roses are planted in rows a yard apart, with about eighteen inches between the plants. The time for planting is autumn or spring. They are propagated by dividing the roots, and also from suckers or runners, which throw up fresh plants. After about three years the plant is liable to be attacked by an insect, the maggot of which destroys the leaves and the young buds. It is, therefore, usual to renew the plantation every two or three years. Some fresh plants are grown every year, only the best of the old stock being preserved. After the fourth year the plants are worth nothing. The tops of the plants are cut every year with shears to encourage the growth of new shoots. Roses will grow either in a light or heavy soil, but they flourish best when the soil is rather heavy.

The season for gathering the flowers of the damask rose commences early in June, and last about five or six weeks. They are gathered by women and children twice a-day, in order to secure the buds before they are too much expanded. The buds are dried in stoves in the same manner as chamomiles, except those required for conserve, which are sent to the market in a fresh state.

2d. The Provence or Cabbage Rose—*Rosa centifolia*, var. *a. vulgaris foliacea*.

These roses are propagated by dividing the roots, and the mode of cultivation resembles, in most respects, that which is adopted with the other variety. They are not, however, liable to the maggot, and the plants are therefore not removed so often. They continue to flourish for many years. They require more care in pruning, the old wood being cut away with a knife, which causes new shoots to be formed, and it is these latter which produce the flowers.

The gathering usually commences the last week in June, and is continued for about five weeks. The flowers being used in the expanded state, they are gathered every other day, which is found to be often enough.

In the process of distillation it is a common practice to put the entire flower into the still as received from the grower, but the result is much improved by rejecting the calyx. This is rather troublesome, as each flower must be separately stripped, which occupies considerable time and increases the expense ; but the labor is well bestowed, as the water is much more fragrant. During the distillation, a quantity of concrete essential oil floats on the water, which when collected resembles the foreign otto of roses. We have seen about half-an-ounce, which resulted from the distillation of 150 gallons of rose water. The quantity, however, is too small to be worth collecting for sale, and it is generally supposed that its abstraction impoverishes the water ; and that, although the water is saturated at the time, it afterwards dissolves by degrees the essential oil which is left floating in it. The water should be strained before it is used, as the particles of oil are likely to produce irritation, especially when the water is used for eye lotions.

V. ACONITE OR MONKSHOOD.

We find that three sorts of aconite or monkshood are cultivated at Mitcham ; but on the 3rd of September (1850) only one sort (termed *giant monkshood*) was in flower.

1. The usual sort cultivated is called *common monkshood*, but we were too late in the season to see it. From the description which was given to us of it, we suppose that it is probably *Aconitum Napellus*. We were informed that it is planted in the autumn (October) by dividing or separating the tubers, and the roots may be gathered the following autumn ; but it is a better practice to leave them for two years in the ground. When gathered they are washed and dried. This sort of aconite flowers in June. One of the growers informed us that he was in the habit of cutting off the flowers ; we suppose for the purpose of promoting the growth of the roots.

2. Mr. Arthur informs us, that the preceding is the only sort of aconite which he cultivates ; but that there is a partly-colored sort grown at Mitcham, the roots of which are sold in the London market. The flowers are white, with a little blue in them. It is a fine tall plant, which like the common aconite, flowers early in the season. We have had no opportunity of seeing this sort.

3. At Mr. Moore's physic-grounds we found another sort of aconite in cultivation, under the name of *giant monkshood*, but we were informed that as yet none of it had been taken to market. The specimens which we saw were about five feet high. The inflorescence was a somewhat loose panicle, with ascending stiffish branches, the helmet conical, the color of the flowers a paler or brighter blue than that of *A. Napellus*, the staminal filaments hairy, the carpels or young fruits converging. The last character readily distinguishes it from *A. Napellus*, the carpels or young fruits of which diverge from each other. It appears to be referable to Reichenbach's section *Corythælon* which is characterized as follows:—(Rad. tuberosa, fol. 5-7-pedata) perianthio deciduo, fructu juniore nutante, carpidiis apice convergentibus." In this section Reichenbach places three species—*A. palmatifidum*, Reichenb., with smooth filaments; *A. exaltatum*, Bernhardt, with hairy filaments and conical helmet; and *A. Stoerkianum*, Reichenb., with hairy filaments and vaulted helmet. From these characters this giant aconite appears to be *A. exaltatum* of Bernhardt, of which "*A. decorum*" is given by Reichenbach as a synonyme. In confirmation of this statement we find that the giant aconite of Mitcham agrees in every particular which we can discover, with a plant growing in the gardens of the Royal Botanic Society, Regent's Park, and ticketed "*Aconitum decorum*." Reichenbach says, this species flowers in July and August in Germany; we found it in flower and beginning to give fruit, both at Mitcham and at Regent's Park, in the beginning of September.—*London Pharm. Transactions*, Oct. 1, 1850.

ON THE CONSTITUTION OF ATROPINE, DATURINE AND ACONITINE.

BY DR. A. VON PLANTA.

Atropine.—The atropine used by the author for these researches was prepared by Merck, and possessed the following properties:—It dissolved in 299 parts of water at the ordinary temperature; dissolved in almost every proportion in alcohol, but less readily in ether; in both liquids, as well as in water, the solubility is increased by heat. It fused at 194° F. to a clear transparent mass,

which became brittle on cooling; on the reapplication of heat, and again allowing it to cool, it was converted into stellate groups of crystals. At 284° a portion is volatilized undecomposed, but the greater portion is destroyed. Heated upon platinum foil, it melts, puffs up, giving off white fumes, and burns with a bright flame, leaving a shining black cinder, which finally disappears entirely.

Atropine has a strong alkaline reaction, and combines with acids, forming salts, which appear mostly not to crystallize; they are soluble in water and alcohol, but very sparingly in ether, especially the muriate and sulphate. On pouring a concentrated alcoholic solution of the muriate into ether, a syrupy solution separates, which did not crystallize after long standing in ice, nor was it possible to obtain the neutral muriate of atropine crystallized by retaining it for several days at a temperature of 86° – 104° . The solution of the muriate of atropine furnishes pulverulent precipitates with potash, ammonia and carbonate of potash, but only with very concentrated solutions, and they dissolve very readily in an excess of the reagent. Carbonate of ammonia, bicarbonate of soda and phosphate of soda give no precipitates; perchloride of gold produces a sulphur-coloured crystalline precipitate, which is sparingly soluble in muriatic acid; chloride of platinum gives a pulverulent precipitate, which cakes together like a resin and is very readily soluble in muriatic acid. The sodio-chloride of iridium gives no precipitate; perchloride of mercury gives one, but only in very concentrated solutions. The potassio-iodide of mercury produces a very heavy, whitish, caseous precipitate, which contracts considerably upon the addition of muriatic acid. Iodide and sulphocyanide of potassium give no precipitate; tincture of iodine strikes a kermes-brown colour; iodic acid, in the cold, no colour. With tincture of galls, a dense flocculent precipitate is obtained, but only after the addition of muriatic acid, in the excess of which it dissolves somewhat. Nitropicric acid produces a sulphur-coloured pulverulent precipitate; nitric acid causes no change either alone or on the addition of protochloride of tin.

Atropine, dried under the air-pump, furnished, on an average of three analyses, Carbon 70.23, Hydrogen 8.23, Nitrogen 5.26, Oxygen 16.28, equivalent to the formula $C_{34}H_{25}NO_6 = 289$.

Daturine, $C^{34}H^{23}NO^6$.—The analysis of daturine led the author to the remarkable result, that daturine is identical with atropine. The preparation examined consisted of fascicles of colourless bright

needles; it was heavier than water, not altered by exposure to the air, perfectly free from smell, and scarcely soluble in water. It dissolved more readily in alcohol than in ether, but in both liquids its solubility was increased by heat. At 190° F. it melts without decreasing in weight; on cooling, it furnishes, like atropine, a brittle, colourless, transparent mass, which at a higher temperature is partially volatilized unaltered. It melts upon platinum, puffs up, giving off white vapours, and burns with a bright luminous flame, leaving a shining black cinder, which at last entirely disappears.

Daturine has a strong alkaline reaction, and forms salts with acids. In the present case it was likewise found impossible to obtain the sulphate and muriate crystallized. They are both readily soluble in water and in alcohol. The muriate of daturine furnishes pulverulent precipitates with potash, ammonia and carbon of potash, but only with concentrated solutions; the precipitates dissolve easily in an excess of the reagent. Carbonate of ammonia, bicarbonate and phosphate of soda give no precipitate; perchloride of gold produces a sulphur-coloured crystalline precipitate, which is slightly soluble in muriatic acid; chloride of platinum, with very concentrated solutions, gives a precipitate, which is at first pulverulent, but soon cakes together like a resin, and then no longer dissolves so readily in muriatic acid. Perchloride of mercury produces a white pulverulent precipitate only in very strong solutions; it is readily soluble in muriatic acid and in chloride of ammonium; no precipitate is produced by sulphocyanide of potassium; tincture of iodine gives a kermes-coloured flocculent precipitate, which soon turns blackish-blue; tincture of galls and tannic acid cause a copious precipitate only on the addition of muriatic acid; that produced by the first reagent dissolves with difficulty in the excess of muriatic acid; that by the second, readily. Nitropicric acid furnishes a yellow precipitate, which is easily soluble in ammonia.

The daturine for analysis was dried under the air-pump; the results do not agree perfectly with the calculation, owing to the presence of a little impurity, which was subsequently detected. An average of three analysis gives Carbon 69.30, Hydrogen 8.09, Nitrogen 4.94, Oxygen 17.75, represented by $C_{34}H_{23}NO_6 = 289$.

Aconitine.—The aconitine employed in this investigation, after being purified by the author, formed a colourless powder, without

smell and not altered by exposure to air; heated upon platinum, it melted very readily, took fire, and left a shining black cinder, which was entirely consumed. It cannot be volatilized like daturine and atropine. Aconitine is heavier than water; it dissolves very easily in alcohol, less so in ether; it melts at 176° F. to a transparent vitreous mass without losing in weight; at 248° it begins to turn brown, and is decomposed at a higher temperature. It has a strong alkaline reaction, completely neutralizes acids, but the salts do not crystallize. The muriate of aconitine furnishes, with potash, ammonia and carbonate of potash, a white flocculent precipitate of aconitine, which is slightly soluble in an excess of the reagent. No precipitate is produced by carbonate of ammonia, bicarbonate of soda or phosphate of soda. Chloride of gold gives a dense yellowish precipitate, which is not perceptibly soluble in muriatic acid; chloride of platinum gives no precipitate. With perchloride of mercury and sulphocyanide of potassium white caseous precipitates are obtained; that formed by the first reagent dissolves without difficulty in muriatic acid and chloride of ammonium. Tincture of iodine produces a kermesine-brown; tincture of galls and tannic acid, upon the addition of a drop of muriatic acid, a dense flocculent precipitate, which requires much muriatic acid for its solution. Nitropicric acid gives a yellow precipitate, insoluble in ammonia. The analysis of aconitine, dried under the air-pump, furnished on an average of three trials, Carbon 67.97, Hydrogen 8.79, Nitrogen, 3.42, Oxygen 19.82, represented by $C_{60}H_{47}NO_{14}$.

It follows from this that the atomic weight of aconitine is 533.66. The muriate of aconitine, prepared by passing muriatic gas at 212° over aconitine, contained 13.41 per cent. of muriatic acid. According to which we have—

		Found.	Calculated according to $C_{60}H_{47}NO_{14} + 2HCl$.
1 equiv. aconitine . . .	533	86.59	87.16
2 equivs. muriatic acid . .	72.92	13.41	12.84
<hr/>			
1 equiv. bimuriate of aconitine	605.92	100.00	100.00

Chemical Gazette, Sept. 16, & *Liebig's Annalen*, lxxiv. p. 245.

ON THE CAUSES AND PREVENTIVES OF MILDEW IN PAPER AND PARCHMENTS, WITH AN ACCOUNT OF EXPERIMENTS MADE ON THE SATURATION OF GROWING WOOD WITH ANTISEPTIC CHEMICAL SOLUTIONS.

BY ALFRED GYDE, Esq., M. R. C. S. E.

The author stated, that, owing to the imperfections formerly existing in the microscope, little was known of the real nature of the class of plants called *fungi* until within the last few years; but, since the improvements in that instrument, the subject of the development, growth and offices of the fungi has received much attention. They compose, with the algæ and lichens, the class of thallogens (Lindley), the algæ existing in water, the other two in air only. A fungus is a cellular flowerless plant, fructifying solely by spores, by which it is propagated, and the methods of attachment of which are singularly various and beautiful. The fungi differ from the lichens and algæ in deriving their nourishment from the substances on which they grow, instead of from the media in which they live. They contain a larger quantity of nitrogen in their constitution than vegetables in general do, and the substance called "fungine" has a near resemblance to animal matter. Their spores are inconceivably numerous and minute, and are diffused very widely, developing themselves wherever they find organic matter in a fit state. The principle conditions required for their growth are moisture, heat, and the presence of oxygen and of electricity. No decomposition or development of fungi takes place in dry organic matter; a fact illustrated by the high state of preservation in which timber has been found after the lapse of centuries, as well as by the condition of mummy-cases, bandages, &c., kept dry in the hot climate of Egypt. Decay will not take place in a temperature below that of the freezing-point of water, nor without oxygen; by excluding which, as contained in the air, meat and vegetables may be kept fresh and sweet for many years.

The action which takes place when moist vegetable substances are exposed to oxygen is that of slow combustion (it has been called by Liebig "eremacausis"); the oxygen uniting with the wood and liberating a volume equal to itself of carbonic acid, and another portion combining with the hydrogen of the wood to form water. Decomposition takes place on contact with a body already

undergoing the same change, in the same manner that yeast causes fermentation. Animal matter enters into combination with oxygen in precisely the same way with vegetable matter; but as, in addition to carbon and hydrogen, it contains nitrogen, the products of the eremacausis are more numerous—carbonate and nitrate of ammonia, carburetted and sulphuretted hydrogen and water; and these ammoniacal salts greatly favour the growth of fungi. Now paper consists essentially of woody fibre, having animal matter as size on its surface.

The first microscopic symptom of decay in paper is irregularity of surface, with slight change of colour, indicating the commencement of the processes just noticed; during which, in addition to carbonic acid, certain organic acids are formed, as crenic and ulmic acids, which, if the paper has been stained by a colouring matter, will form spots of red on the surface. Spots of the same kind are similarly formed on leather coloured during its manufacture. Provided that fungi have not taken root, the colour can be restored by ammonia or any alkali. The same process of decay goes on in parchment as in paper, only with more rapidity, from the presence of nitrogen in its composition. When this decay has begun to take place, fungi are produced, the most common species being *Penicillium glaucum*. They insinuate themselves between the fiber, causing a freer admission of air, and consequently hasten the decay.

The substances most successfully used as preventives of decay are the salts of mercury, copper and zinc. Bichloride of mercury (corrosive sublimate) is the material employed in the kyanization of timber, the probable mode of action being its combination with the albumen of the wood, to form an insoluble compound insusceptible of spontaneous decomposition, and therefore incapable of exciting fermentation. The antiseptic power of corrosive sublimat may be easily tested by mixing a little of it with flour-paste, the decay of and appearance of fungi on which are quite prevented by it. Next to corrosive sublimate, in antiseptic value, stands the salts of copper and zinc. Chloride of zinc has been patented by Sir W. Burnett for the preservation of wood, sail-cloth, &c., and appears to succeed admirably. For use in the preservation of paper, the sulphate of zinc is better than the chloride, which is to a certain extent deliquescent.

A series of experiments were made, in the summer of 1840, on the use of metallic and other solutions for the preservation of wood. A deep saw-cut was made all round the circumference of some growing trees near their base, into which the solutions were introduced by forming a basin of clay beneath the cut ; thus the solution took the place of the ascending sap, and in periods of time varying from one to three days was found to have impregnated even the topmost leaves of trees fifty feet high. The trees were chiefly beech and larch. After impregnation they were felled, and specimens about five feet long by two inches square were cut out, and packed in decaying sawdust in a warm damp cellar, where they were left for seven years. The details of the experiment are given in a table, by which the following general rules are made to appear:—The pieces of wood saturated with sulphate of copper in the proportion of one pound to one gallon of water, or with acetate of copper in the proportion of one pound to one pint of vinegar and one gallon of water, were found in perfect preservation, clean, dry and free from fungus ; but the remaining pieces, which were saturated with nitrate of soda, prussiate of potash, acetate of iron, sulphate of iron, common salt and kreosote, presented much decay and a large growth of fungi.

The results obtained from solutions of corrosive sublimate, one-eighteenth of a pound to a gallon of water (Kyan's proportion), varied in an anomalous manner.

The paper was accompanied by specimens of the wood, showing how complete had been the saturation.—*Chemical Gazette*, July 1, 1850.

ON THE GAMBOGE TREE OF SIAM.

BY DR. CHRISTISON, V. P., F. R. S. E.

Although gamboge has been known in European commerce for nearly two centuries and a half, and its applications in the arts have been extended in recent times, the tree which produces it is still unknown to botanists.

The late Dr. Graham, in 1836, was the first to describe accurately a species of *Garcinia*, which inhabits Ceylon, and which is well

known there to produce a sort of gamboge, not, however, known in the commerce of Europe. Resting on a peculiarity in the structure of the anthers, which are circumscissile, or open transversely by the separation of a lid on the summit, he constituted a new genus for this plant, and called it *Hebradendron cambogioides*. At the same period the author examined the properties of this gamboge, and found that it possesses the purgative action of the commercial drug in full intensity, and that the two kinds agree closely also, though not absolutely, in chemical constitution.

At an earlier period Dr. Roxburg described, in his *Flora Indica*, another species of *Garcinia*, under the name of *Garcinia pictoria*, which inhabits the hills of Western Mysore, and which also was thought to produce a sort of gamboge of inferior quality. In 1847 specimens of the tree and its exudation were obtained near Nuggur, on the ghauts of Mysore, by Dr. Hugh Cleghorn, of the East India Company's service; and the author, on examining the gamboge, found it all but identical with that of Ceylon in physiological action, in properties as a pigment, and in chemical constitution. The same plant, with its gamboge was about the same time observed by the Rev. F. Mason, near Mergui in Tavoy, one of the ceded Burmese provinces.

A third species inhabiting the province of Tavoy, and also producing a kind of gamboge, was identified by Dr. Wight in 1840 with Dr. Wallich's *Garcinia elliptica*, from Sylhet, on the north-east frontier of Bengal. Its exudation was long thought to be of low quality; but, although this substance has not yet been examined chemically, it has been stated by Mr. Mason to be, in his opinion, quite undistinguishable as a pigment from Siam gamboge.

It is a matter of doubt whether Graham's character is sufficiently diagnostic to be a good generic distinction. But it was shown by Dr. Wight in 1840, that a well-characterised section at least of the genus *Garcinia* consists of species which have "sessile anthers, flattened above, circumscissile, and one-celled;" and that all these species, and no others, appear to exude a gum resin differing probably very little from commercial gamboge.

Still the tree which produces Siam gamboge, the finest and only commercial kind, continues unknown. A strong presumption however arose, that the last species was the Siam tree, as it grows in the same latitude with the gamboge district of Siam, and not above

200 miles further west. But if the information recently communicated to the author be correct, the Siam tree is a fourth distinct species of the same section. In December last, he received from Mr. Robert Little, surgeon at Singapore, specimens taken from two trees which were cultivated there by Dr. Almeida, a resident of the colony, and which were obtained by him "direct from Siam," as the gamboge tree of that country. These specimens are not such as to allow of a complete description; yet they are sufficient to show that the plant presents the characters of Wight's gamboge-bearing section of the genus *Garcinia*; but that it is not any of the species hitherto so fully described as to admit of comparison with it. The fruit is round, not grooved, crowned by a four-lobed knotty stigma, and surrounded by numerous sessile or subsessile aborted anthers, and by a persistent calx of four ventricose fleshy sepals. The male flowers consist of a calx of the same structure, a corolla of four ventricose fleshy petals, and a club-shaped mass of about forty subsessile anthers, closely appressed, connected only at the mere base, one-celled flattened at the top, and opening by a circular lid along a line of lateral depressions; and there is no appearance of an aborted ovary amidst them. These are the characters of the three species presently known. These three species very closely resemble one another in general appearance and special characters. The new species presents the same close resemblance to them all; and, in particular, its foliage is undistinguishable from that of *Garcinia elliptica*, the leaves being acuminate, and leathery, exactly as described and delineated by Wight. But it differs from them all in the male fruit and flowers being peduncled. The male flowers are fascicled, and have a slender peduncle three-tenths of an inch in length. The single young fruit attached to one of the specimens has a thick, fleshy peduncle, like an elongated recepticle, half as long as the male peduncle. All the other species hitherto described, have both male and female flowers, sessile or subsessile. As this difference cannot arise from a mere variation in the same species, the plant must be a new one. The evidence, however, that it produces gamboge, and more especially the gamboge of Siam, is not yet complete, and, until further information on this point be obtained, which the author expects to receive in the course of the year, it appears advisable not to attach to it a specific name. A question may even arise whether the male flowers and

the fruit here described may not belong to two species instead of one ; but this is far from probable.—*Proceedings of the Royal Society of Edinburgh*.

[Although several months have elapsed since the above paper was read, its value is increased by the following extract of a letter from the author, which accompanied a copy of the paper :—]

“ I am now able to inform you further, that the plant described in my paper, ‘ On the Gamboge Tree of Siam,’ is diœcious ; that additional specimens confirm all therein stated, and that the concrete juice of which a small portion has been sent to me, possesses all the sensible qualities of the finest Siam pipe-gamboge of commerce. I have no longer any doubt that we have hit on the true tree at last. There may be a shade of question raised whether Dr. Almeida’s trees, of which he has three about twelve feet in height, may not belong to more than one species, and, therefore, which of them may be the true gamboge bearer. But I have myself scarcely any doubt that there is only one species. With a little more information, which I expect to have in six or eight months, I shall be in a condition to give a complete account of the matter. But meanwhile it may interest you and your friends to know what has been already done.—*Pharmaceutical Journal*, November 1, 1850.

ON THE MANUFACTURE OF PYROXYLIC SPIRIT, OR WOOD-NAPHTHA, ACETATE OF LIME, AND ACETONE, OR PYROACETIC SPIRIT.

BY JACOB BELL.

Editor of the [London] Pharmaceutical Journal.

Separation of the Liquid Products of Distillation from each other.—The condensed liquid products before described, [resulting from the distillation of wood in iron cylinders] form by subsidence in the tank or receptacle two layers, the lower, composed of tarry and oily matters, and the upper containing the acid and spirituous parts of the products. If two tanks be provided, the one at a lower level than the other, the acid and spirituous liquor passes by means of an overflow-pipe into the lower tank, and thus become separated from the tar ; and if the acid liquor in passing from one tank to the other be made to traverse a suitable filter, a large por-

tion of the tarry and oily matters held mechanically in suspension by the acid liquor will be returned.

The next process depends upon the method of working adopted at each particular manufactory; but without individual reference we may class them all under two heads. First, those who distil the pyroxylic spirit direct from the crude acid liquors; and, secondly, those who first neutralize the acid liquors with lime and then distil off the spirit. The first class employ *copper* stills of a capacity of about 500 gallons; into these the crude acid liquor is pumped, and heat applied either by means of steam made to traverse a coil of well-connected copper pipes placed within the still, as at Pitchcombe Works, or the stills are heated externally as at Cwm Avon Works. In the second case sheet-iron stills or boilers are employed, and the previously neutralized acid liquor run into them, and external heat applied as at the Melancrythan and other works. In each case about 100 gallons, or one-fifth of the contents of the still, are distilled off and put by as containing all the pyroxylic spirit, the further distillation and purification of which we shall hereafter speak of. In the first case the remaining acid is next distilled off, and the residuary tarry liquor run off through a cock placed in the lower part of the still; or if distilled acid be not required, the remaining 400 gallons are run off into a suitable tank or reservoir, in which the tar settles to the bottom, and the acid liquor may be drawn off or pumped up for further use. In the second case the remaining 400 gallons of neutralized acid liquor, or acetate of lime solution, is run out of the still, and employed as will be hereafter described.

The tarry product of the distillation of wood is also distilled in copper or cast-iron stills, and the crude spirit obtained therefrom is added to that obtained from the distillation of the acid liquor above-mentioned.

Manufacture of Pyroxylic Spirit or Wood Naphtha.—The crude and weak spirit procured in the distillation before mentioned, is next subjected to repeated distillations in order to obtain the spirit in a more concentrated form, which is then rectified by distillation, first with lime alone, and lastly with a mixture of lime and caustic potash. In some works chalk is employed, and in others lime and bicarbonate of soda. For this purpose copper stills are employed, and steam heat applied either through a coil of lead

pipe placed within the stills, or to the outside of the still, the lower half of which has been previously cased in an iron jacket. The pyroxylic spirit thus obtained is perfectly colourless, and is to be met with in the market of specific gravity varying from 0.870 to 0.8320.

The quantity as well as the quality of the pyroxylic spirit obtained at one works often differs much from that obtained at another works; the kind of wood employed has something to do with this, but management of the process much more. The quantity varies from $1\frac{1}{4}$ gallon to $2\frac{1}{2}$ or even three gallons per ton of wood employed.

The following Table was constructed by Dr. Ure, with the view of showing the per centage of real spirit in pyroxylic spirit of different specific gravities. The wood spirit employed in the construction of this Table was purified by distillation over powdered quicklime, and was drawn over with the heat of a water-bath at such a temperature that its specific gravity was 0.8136 at a temperature of 60° Fahr.

Specific Gravity	Real Spirit per Cent.	Over Excise Proof.	Specific Gravity.	Real Spirit per Cent.	Over or under proof.
.8136	100.00	...	.9032	68.50	13.10
.8216	98.00	64.10	.9060	67.56	11.40
.8256	96.11	61.10	.9070	66.66	9.30
.8320	94.34	58.00	.9116	65.00	7.10
.8384	92.22	55.50	.9154	63.30	4.20
.8418	90.90	52.50	.9184	61.73	2.10
.8470	89.30	49.70	...	...	underproof
.8514	87.72	47.40	.9218	60.24	0.60
.8564	86.20	44.60	.9242	58.82	2.50
.8596	84.75	42.20	.9266	57.73	4.00
.8642	83.33	39.90	.9296	56.18	7.00
.8674	82.00	37.10	.9344	53.70	11.00
.8712	80.64	35.00	.9386	51.54	15.30
.8742	79.36	32.70	.9414	50.00	17.80
.8784	78.13	30.00	.9448	47.62	20.80
.8820	77.00	27.90	.9484	46.00	25.10
.8842	75.76	26.00	.9518	43.48	28.80
.8876	74.63	24.30	.9540	41.66	31.90
.8918	73.53	22.20	.9564	40.00	34.20
.8930	72.46	20.60	.9584	38.46	35.60
.8950	71.43	18.30	.9600	37.11	38.10
.8984	70.42	16.60	.9620	35.71	40.60
.9008	69.44	15.30			

The following table is by M. Deville, with a view to show the per centage of real spirit in naphtha of different specific gravities at the temperature of 48° 5 Fahr.

Quantity of Water.	Specific Gravity.
00 per cent.	0.8070
10 "	0.8371
20 "	0.8649
30 "	0.8873
40 "	0.9072
50 "	0.9232
60 "	0.9429
70 "	0.9576
80 "	0.9709
90 "	0.9751
95 "	0.9857

"If," says M. Deville, "these results are brought to a temperature of 60° Fahr., it will be found that there is an almost entire correspondence between alcohol and wood spirit, and that the latter equally with the former shows a maximum of contraction, which always takes place on the combination of one part of wood spirit with three of water, that is to say, in a mixture containing 45.75 per cent. of water. Dr. Ure has also constructed a table of the specific gravities of mixtures of wood spirit and water; but he has given 0.8136 as the specific gravity of anhydrous wood spirit, at a temperature of 60° Fahr." In an article on Pyroxylic Spirit and its compounds, which appeared in Thompson's *Records of Science*, vol. ii., page 374, it is stated, "the lowest specific gravity, to which, as far as we are aware, it has been brought in this country, is 0.812. Dumas, however, states that its density at the temperature of 68° is 0.798, and that of its vapor 1.120. Its boiling point, according to the same authority, is 151 $\frac{3}{4}$ °, at a pressure of 30 inches. Mitscherlich gives 0.798 as its specific gravity, and 180° Fahr. as the boiling point. Mr. Scanlan, in the *Proceedings of the British Association*, 1835, gives .828 as the specific gravity, and 150° as the boiling point. "Wood spirit of 0.870 specific gravity," says Dr. Ure, "boils at 144° Fahr., and if it be brought by distillation to specific gravity 0.832, it boils at 140° Fahr." The commercial wood spirit varies very much both as to its specific gravity and its power of dissolving gum sandrac, shellac, &c., from its containing acetone, mesite, &c., in variable proportions. The presence of these bodies is to be accounted for by the variation in the modes employed for obtaining and purifying the wood spirit, as

also by the more or less careful management of the several processes it is made to undergo. The question then naturally arises, how are we to judge of the quality of wood spirit?—will a knowledge of its specific gravity, or of its boiling point, guide us in this respect? If a wood spirit be required for burning in a spirit lamp, or for singeing horses, there can be no doubt but that the spirit of the lowest specific gravity is the best; but if the wood spirit be required for the manufacture of varnishes and polishes, especially those containing gum sandrac, then the above criterion will not apply. For instance, a sample of wood spirit containing 85 per cent. has been far preferred to that of another sample containing 95 per cent. We have invariably found that the wood spirit obtained by liming the crude liquor from the cylinders before distillation, does not dissolve sandrac, whilst that obtained by distilling off the spirituous portion of the crude liquor before liming, is a good solvent of sandrac, the spirit in the first case being of a low specific gravity, and miscible with water, whilst the latter contained less real spirit, and was rendered milky on the addition of water. At one works, upwards of two and three-quarter gallons per ton have been obtained on the average working of nearly 2000 tons of wood; whilst at another, a weekly consumption of 80 tons of wood has yielded only 160 gallons of pyroxylic spirit; and at a third, only 42 gallons have been obtained from 36 tons of wood.

Manufacture of Acetate of Lime.—The commercial acetate of lime is of two qualities, respectively designated grey and brown lime salt; these are obtained by saturating with lime either the distilled acid before mentioned, or the undistilled acid after the pyroxylic spirit has been removed by distillation, and evaporating the clear solution almost to dryness, or by evaporating the solution of acetate of lime as run off from the stills in the case in which the crude acid has been neutralized with lime previous to the distillation of the spirituous product. This saturation either of the crude acid previous to distillation, or the distilled acid, or the undistilled acid, is in either case performed in the same manner. The acid liquor is passed into wooden or iron vessels of convenient capacity, say from 500 to 1000 gallons each, and a quantity of either powdered chalk or of slacked and sifted lime, previously made into the consistence of cream with water, is added until the blue color

of litmus paper is no longer reddened ; a slight excess of lime is then added, with a view to render the separation of the oily matters more complete. A portion of the tarry matters are carried to the bottom with the impurities of the chalk or lime employed, and part of the oily matters, combined with the lime, float on the surface, and are removed by skimming. The solution of acetate of lime when clear, is ready for the evaporating pans, which are either wood vessels lined with lead and furnished with coils of wrought iron steam pipes in connection with a boiler, or shallow pans of sheet iron, set over a naked fire—the boiling solution is repeatedly skimmed to remove the tarry matter floating on the surface ; and the salt as fast as formed is fished out by means of large skimmers, and thrown into wicker baskets suspended over the pans, so that the liquor draining from the salt may not be allowed to cool. The following practical result was obtained by the use of three sheet-iron pans about eighteen inches in depth, and capable of containing 450 gallons of acetate of lime liquor each :—First six days of 24 hours each, 7020 gallons of liquor were evaporated, producing 78 cwt. of dry acetate of lime. Second week, 8060 gallons were evaporated, producing 92 cwt. of dry acetate. Third week, 7000 gallons were evaporated, producing 78 cwt. of dry acetate. Two of the pans contained brown acetate of lime liquor, and the other grey acetate liquor.

The next part of the process is the drying of the drained acetate of lime. This is usually effected by placing it on the top of the mass of brickwork in which the retorts, or cylinders, or ovens, are set ; but as there is seldom room to dry the whole of the salt in this way, many works are furnished with a drying-house in addition, and, where the lime is made on the spot, the waste heat from the kiln or furnace is made available for drying the acetate, it being made to traverse the flues beneath the floor of the drying house. As a general rule, however, the drying of the acetate of lime is a part of the process of this manufacture by no means well executed, requiring as it does, more attention than the workmen are usually disposed to give to it.

Some very good directions have been given by Plücker for the manufacture of acetate of lime, though some of them are not readily practicable on the large scale, and would require more additional labor and fuel than would be compensated for by the extra price to be obtained for the acetate in the market. He recommends the

filtration of the crude acid through layers of saw-dust and gravel before it is neutralized with lime, and that the solution of the acetate having been brought to boil, should be filtered or allowed to stand for thirty-six or forty-eight hours; also that at two subsequent periods of the operation the solution of lime salt should be drawn off from the evaporating pans, and either filtered or be allowed to settle, and the clear liquor further evaporated. As for filtration, that is quite out of the question, but it is certain that much impurity is deposited when the hot solutions are allowed to cool. In works where 10,000 gallons of lime salt liquor are made every week and have to be evaporated, this could not be effected without a considerably increased expenditure of fuel and labor. The following sketch of a drying furnace and of directions for drying the acetate of lime will be found useful.

The drying furnace is a simple wind furnace, seven or eight feet long, and four and a half to five feet broad, built of brick. At six inches above the ground is an ash pit, eight inches broad and twelve inches high, which is covered with a grate of bricks. The fire-place is twenty inches high, and ten inches broad at the grate; over it is an arch of bricks, so that the fire cannot play on and heat very highly the iron drying-plate lying on the side of the hearth. The space below the drying-plate is separated from the earth by a partition of bricks three or four inches high; twelve inches above the outlet of the hearth there is a layer of iron bars, one and a half to two feet from each other, and upon these is deposited the drying-plate. This consists of cast-iron, one quarter of an inch thick, and is formed according to the size of the furnace. Round the plate the furnace is built up to the height of ten inches, on the side of the front wall, leaving room for doors, which may be calculated at two and a half feet. These doors are two, one above the other, through which the whole interior of the furnace can be inspected. They are formed of plate-iron and have in their middle a sliding door to admit of the exit of the vapour of the acetate of lime, and of some ventilation. A wall built at the end of the plate, or clay partition, separates the whole of the drying plate from the chimney. In the walls of the furnace iron bars are fixed, and upon these bars a second drying-plate, which covers the drying space. This plate, as it does not come in contact with the fire, may consist of good iron or of clay.

Above this drying space another is formed by means of the chimney. The heat passes as well under as above the drying space, and passes into the chimney, which is situated at the side of the furnace, and can be shut by a valve. In the drying space the temperature is usually between 60° and 90° R. (167° to $234\frac{1}{2}^{\circ}$ Fah.).

Turf forms the best material for fuel, as it does not burn rapidly, and produces a steady and equal temperature.

Drying of the Acetate of Lime.—When the furnace is thoroughly and equally heated, the flame of the fire is allowed to subside. If wood is employed as fuel, the sliding door should be opened at the commencement in order to allow the moisture to escape. The salt is transferred from the evaporating vessel to the drying plate, and spread out to the depth of two inches; and after the first portion has become somewhat dry, the depth is increased to four or five inches, the heat is preserved at the degree already mentioned, for twenty-four hours, and during this time the salt is turned several times. Subsequently, when the mass appears to be becoming dry, the temperature may be increased to 100° (257° Fah.), so as to dry it completely. The mass is dry and properly roasted when it possesses the following characters:—It must, before cooling, be brittle, easily crumbled between the fingers, mixed with blackish carbonaceous points or streaks, between which appear white pieces of dry salt. A solution of the comminuted salt, in four or six times its volume of hot water, possesses a yellowish brown color with a dark tinge, while previously it had a reddish brown color. When the heat is increased towards the end of the process, as described, care must be taken to do it gradually so that no smoke shall rise from the acetate, because it might thus be decomposed. Neither must any spark be permitted to come in contact with the acetate of lime; because, like sugar of lead, it possesses the property, in these circumstances, of catching fire and burning—by which the whole dry preparation would be completely destroyed. The treatment of the acetate of lime in this manner, by means of gradual drying, as experience has shown, possesses many advantages over the method of drying the salt in an open vessel; because there is no loss of acetic acid, as always occurs by the latter process. The operator has the preparation completely in his power, and with little expense of fuel and time, many hundred weights of salt can be prepared at once. This process does not merely extend to the removal of the moisture

from the acetate of lime, but a chemical influence is exerted by means of it; because it is certain that the substances formed by dry distillation, which have been recently distinguished by Reichenbach, are partly dissipated by the heat, and partly decomposed, the acetate of lime possessing very different properties before and after the process. After the process the salt does not imbibe water so readily as it did previously. After solution, filtration, and evaporation, a much purer product is obtained than before, and upon the filter a resinous matter remains, the constituents of which have not yet been examined.

It will be seen from an inspection of one of the tables given under Part I., that the quantity of acetate of lime obtained from a given weight of wood varies according to the kind of wood employed; it may however be estimated on the large scale as about 140 pounds of brown salt per ton of wood of average dryness, the average result obtained at one works from nearly 2000 tons of wood, and at another from the weekly consumption of 80 tons, being as near as possible that amount; larger products have been obtained, even as high as 150 pounds, but the quantity above stated is a fair estimate of the produce on the large scale.

Manufacture of Pyro-acetic Spirit, or Acetone.—The usual mode of obtaining pyro-acetic spirit is by the decomposition of the acetates by means of heat. For this purpose the acetate is submitted to dry distillation in a retort, great attention being paid to the temperature, which should be kept as low as possible consistent with the decomposition of the acetate employed. The distillation should be conducted with a slowly increasing heat, as the quicker the temperature is raised, the larger is the quantity of pyro-acetic spirit destroyed, carbon remains in the retort, and the empyreumatic oil formed renders the spirit impure. In the case of the metallic acetates, water, acetic acid, and pyro-acetic spirit, pass off in a state of vapor, and are condensed; carbonic acid and carburetted hydrogen gases are the incondensable products, whilst the metallic base, mixed with some carbonaceous matter, remains in the retort. The metallic base is usually reduced to the metallic state, and the more difficult this reduction is, the greater is the quantity of pyro-acetic spirit formed.

Acetates, the bases of which retain carbonic acid at a red heat, produce, when heated in close vessels, the carbonate of the base and

acetone. This takes place, for example, with the acetates of potassa, soda, and baryta. Where the oxide cannot retain carbonic acid at a red heat, as in the case of acetates of magnesia, zinc or manganese, the acetone is accompanied by carbonic acid. If the oxide be easily reducible, as in the acetates of copper, silver, and mercury, there are given off hydrated acetic acid, carbonic oxide, carbonic acid, water, and acetone, and there is left a mixture of the metal with carbon in a minute state of division.

In Thomson's *Inorganic Chemistry*, vol. ii., p. 23, edit. 1831, there is a table of the relative quantity of products obtained from the decomposition of several metallic acetates. The following extract shows the quantity of pyro-acetic spirit obtained :—

Acetate of silver - - - - -	0.00
“ copper - - - - -	0.17
“ nickel - - - - -	0.20
“ iron - - - - -	0.24
“ lead - - - - -	0.55
“ zinc - - - - -	0.69
“ manganese - - - - -	0.94

The acetates of potash, soda, lime, and baryta yield a much larger proportion of pyro-acetic spirit than any of the metallic acetates, and are therefore generally employed for this purpose, more especially the acetate of lime. It would appear that the acetates of silver and of baryta stand at the two extreme points of the list of acetates in respect to the production of pyro-acetic spirit; the former yielding only a concentrated acetic acid with not a trace of spirit, whilst the latter yields a liquid product almost entirely spirituous, with scarcely a trace of acid. The acetate of copper also yields but a small proportion of pyro-acetic spirit; hence its employment, as we shall subsequently notice, in the preparation of aromatic vinegar.

Dumas submitted to dry distillation 100 parts of acetate of baryta, composed of

Baryta - - - - -	56.0
Acetic acid - - - - -	37.4
Water - - - - -	6.6
	<hr/>
	100.0

and capable, therefore, of yielding 21.5 per cent. of pyro-acetic

spirit. The result of several experiments gave the following products:—

Carbonate of baryta - - -	72.2
Charcoal - - - - -	1.2
Pyro-acetic spirit - - -	18.3
Water - - - - -	6.6
Gas and loss - - - - -	1.7

100.0

On the supposition that the presence of the charcoal arose from the decomposition of a part of the pyro-acetic spirit, there would be about two per cent. of spirit to be added to the above, which would give near about the theoretical quantity. Taking the product at eighteen per. cent., one cwt. of acetate of baryta should furnish $2\frac{1}{2}$ gallons of pyro-acetic spirit. Not more than two gallons is obtained from the ordinary acetate of lime of commerce, and the results obtained by operating on some tons of this salt did not give even this amount of produce, no doubt on account of sufficient attention not having been given to the due regulation of the temperature. The acetate of lime was placed in shallow trays of about two feet square and two inches in depth, and fifteen or sixteen of these trays placed over each other in an iron cylinder employed for the distillation of wood. The crude spirit is rectified by successive distillations over quick-lime, when a limpid colorless fluid, specific gravity 0.7921, is produced. It is soluble in water, alcohol, and ether, and burns with a whitish flame.—*Pharm. Jour.*

ON THE ACTION OF MERCURIAL OINTMENT AND THE VAPOR OF MERCURY.

BY F. VON BÄRENSPRUNG, M. D.

1. Notwithstanding the daily employment of mercurial frictions, the question of the manner in which the action takes place has but seldom been taken up. The metallic mercury obtained in the blue ointment must necessarily penetrate the epidermis and corium, to come into contact with the blood and the internal parts of the body. Animal membranes are permeable to liquids; mercury is

a liquid; hence there would scarcely be any doubt *à priori* that this penetration is possible. It has already been shown by Bèclard and Krause, that liquid mercury cannot penetrate the epidermis even when subjected to a perpendicular pressure of 26 inches; but the extremely finely-divided state in which it exists in the ointment might possibly present a favorable condition for endosmosis. Hence I first made some experiments with dead animal membranes. A pig's bladder was stretched over a vessel, and blue ointment rubbed upon it for a quarter, half, one, and even several hours; the ointment never disappeared entirely, but there remained at last a tenacious bluish-gray layer on the surface. When the friction was concluded, the under side of the bladder was examined with the microscope; and with a clean piece of gold. Globules of mercury can be readily detected under the microscope in the form of spherical corpuscles, appearing perfectly black and opaque by transmitted light, but exhibiting by reflected light a bright white and shining luminous spot. Gold is at least an equally delicate test from its power of forming an amalgam; and a globule of mercury which is barely perceptible to the naked eye produces a distinct white spec upon a piece of gold. In the numerous experiments which were made, however, both methods always yielded a negative result; neither in any case could a trace of the metal be detected between the coats of the bladder on stripping them off; nor was a different result subsequently obtained, whether the friction was performed upon the porous or the mucous surface, or whether a dry or wetted bladder was used, or one impregnated with fatty matter. It was therefore repeated with the more delicate bladder of the calf and sheep; and lastly, with the peritoneal coat of the liver of a calf, a membrane so thin that the smallest print can be read through it; but in this case the piece of gold which had been enveloped in it did not exhibit any spot, nor did the microscope detect any globules.

But the structure of the human skin and that of animals is different from that of the serous and mucous membranes; and it might be considered possible that the mercurial particles were rubbed into the orifices of the hair-cavities, the sebaceous and sudoriparous glands, and were thence taken up into the capillary vessels. But it is incorrect to imagine that the above organs are open canals;

they are perfectly filled with cells, which exactly resemble the cells of the epidermis; moreover direct experiments have proved this view to be untenable. When the friction was made upon a piece of human skin, or that of a cat or rabbit, mercury could never be detected on its inner surface; and microscopic examination showed that the ointment had penetrated into the external orifices of the follicles, but never further into them.

These facts undoubtedly show that the metallic mercury cannot permeate dead animal membranes endosmotically. The laws of endosmose apply equally to dead and living bodies; still it appeared worth while to obtain distinct proof in regard to the latter. $\frac{1}{2}$ a drachm of mercurial ointment was therefore daily rubbed in the skin of a rabbit which had been carefully shaved, until the tenth day, when the animal died with the symptoms of mercurialism. The inner surface of the skin, after having been carefully separated, and the blood and all the more important organs, were most minutely examined; but the result was in no wise different. The same experiment was performed upon several other rabbits, dogs and a cat, all of which shortly died of mercurialism; but in no case could the least trace of metallic mercury be detected in the body.

The ingenious experiments of Autenrieth and Zeller, who first caused the skin to cicatrize over pieces of gold inserted beneath it, and then rubbed mercurial ointment upon it, and on subsequent examination found them unaltered, were long ago attended with the same result; this was however controverted by Æsterlen, who rubbed the ointment into dry membranes and the skin of living animals, and states that he always found numerous globules of mercury, not merely in and under the skin, but in almost all the organs, tissues and secretions. With regard to this point, it must be remarked, that, unless the most scrupulous care be taken in cleaning the hands, the knife, the object-slide, &c., globules of mercury may be found wherever they may be looked for. If we consider, moreover, that Æsterlen also found that powdered charcoal passed by absorption from the intestine into the lacteals, we shall be justified in doubting the accuracy of these experiments, and giving the preference to my experiments.

Since it has therefore been shown that the metallic mercury in mercurial ointment does not pass into the body as such, it re-

mains to be shown in what other manner this passage takes place.

When mercurial ointment is melted in a test-glass, the metal separates from the fat, so that the former constitutes a white layer at the bottom of the glass, whilst the latter forms a yellow supernatant liquid; whilst between the two there is a thin black stratum, which appears thinner when recently prepared ointment is used, and deeper when the ointment is old. This is also seen when the metal is separated from the fatty matter by solution in ether. Hence, in addition to metallic mercury and fatty matter, the ointment contains a black substance, the quantity of which increases with its age; it is also a well-known fact, that the ointment gradually gets darker by keeping. It is natural to regard this black matter as protoxide of mercury, the formation of which is favored by the absorption of oxygen occurring whilst the fatty matter was becoming rancid. That this was the case should be proved by the following experiment. Some freshly prepared ointment was treated with ether, the solution poured off; the metallic residue was washed with ether, and then treated with water to which a few drops of sulphuric acid had been added. The acid, which was cold, and very dilute, could not attack the metallic mercury, but would dissolve any oxide which was present. A few drops of solution of sulphuretted hydrogen were added to the filtered solution, when a brown turbidity immediately appeared, which after some hours had subsided in the form of flakes. When, instead of the fresh ointment, some of which had been longer kept was used, the same reaction appeared much more strongly, and a distinct precipitate of sulphuret of mercury was formed.

In another experiment, acetic acid was substituted for the sulphuric acid. The result was the same. *It is thus proved that mercurial ointment contains protoxide of mercury in addition to metallic mercury and fatty matter.**

Donovan and Christison long since asserted this to be the case,

*That finely-divided mercury gradually becomes partially converted into oxide is in conformity with Poggendorff's experiments, according to which the surface of a perfectly pure mass of mercury soon loses its mobility for feeble electrical actions. If the mercury be placed in contact with acid, it reobtains its mobility, which it loses only in gases containing oxygen, not in carbonic acid and hydrogen. See Pogg. Annal., lxxvii. p. 9.

but the younger Mitscherlich rendered it again doubtful. The two former even believed that a fifth part of the mercury was oxidized, which proportion appears far too great in accordance with my experiments; it is moreover possible, that, in addition to keeping, finer trituration might increase the amount of oxide considerably. Guibourt, on the other hand, arrived at the result that only the one five-hundredth of the mercury was oxidized, that it did not exist in a free state in the ointment, but was combined with an acid. To decide this question I tested the ethereal solution, which contained the fatty matter of the ointment, by means of a single pair of plates. A strip of sheet copper and of zinc were soldered together at one end in such a manner as to represent in form a tuning fork. When this simple apparatus is immersed in a liquid containing mercury in organic combination, in consequence of the galvanic decomposition the metal is thrown down upon the copper pole in the form of a gray film, which when rubbed upon the copper colors it white. This method has been recommended several times, and is so delicate that it detects one-tenth of a grain of corrosive sublimate in an ounce of a solution of albumen. But no mercury could be separated from the blue ointment by this means.

We must therefore undoubtedly consider the oxide as the active ingredient of the blue ointment. But even the oxide cannot be taken into the body without the aid of a solvent; and this solvent is, in all probability, the free acid of the cutaneous secretion. Both the perspiration and the fatty secretion of the sebaceous follicles exhibit an acid reaction; and, according to Anselmino, the perspiration contains a considerable amount of free acetic acid. The acetic acid dissolves the oxide, and this solution readily transudes through animal membranes and the cells of the epidermis.

If this explanation be true, *the greater part of the mercury contained in the blue ointment is perfectly inactive*, and we ought to be able to form a far more active ointment from the pure protoxide. This can, in fact, be done. An ointment containing ʒj. of the black oxide of mercury to ʒij. of fatty matter, hence as much as the blue ointment contains of metallic mercury, acts as an active poison to animals upon which it is rubbed in, and a scruple of it killed a cat in four days, and a rabbit in twenty-four hours. From some experiments which I made upon some patients with an ointment contain-

ing only 1 gr. of the oxide to \mathfrak{zj} . of fatty matter, I should consider this preparation as about equal in strength and action to the blue mercurial ointment.

The result which we have obtained in regard to the blue ointment may also be extended to a series of other preparations which are made by the trituration of metallic mercury with various substances, but are destined for internal administration. Among these are the *Æthiops per se*, the *Hyd. c. Cret.* (P. L.), the *Hyd. c. Magn.* (P. Dubl.), the *Æthiops graphiticus* (P. Sax., *Mercurius gummosus Plenckii*, *Æthiops saccharatus*, *Æthiops tartarisatus Sellii*, *Pil. Hydrargyr.* (P. L.). As metallic mercury is no more able to penetrate the mucous membrane of the intestines than the skin, the action of these preparations can only depend upon the oxide they contain, which is formed by the trituration, and is dissolved by the free acid of the gastric and intestinal secretions. This view was confirmed by a preparation which had been made by triturating 1 part of mercury with 2 of sugar for several hours. When treated with water acidified with sulphuric acid, it yielded a solution which gave a brown turbidity with sulphuretted hydrogen. Most of these preparations have become obsolete on account of their uncertain and feeble action. Moreover, there can be no doubt that the very uncertain action of mercurial ointment does not depend merely upon the various susceptibilities of individuals, but also upon the varying quantity of oxide contained in it; and as individuality always remains an incalculable quantity x , it would be advisable, with a view to obtain the most uniform effects, to substitute for the second x a constant magnitude, and to replace the blue ointment by an ointment containing the protoxide.

II. The poisonous action of the vapor of mercury is well known. Small animals die in an atmosphere of it; and man, when constantly exposed to its influence by his calling, suffers sometimes from coughs and bronchitic symptoms, sometimes from the peculiar mercurial tremors, sometimes from gingival affections, and other phenomena of mercurial cachexy. Although cases of the first kind are attributable to mere local irritation of the respiratory organs, the latter decidedly indicate absorption; hence arises the question, Can the vapor of mercury penetrate animal membranes?

It is well known that a piece of gold suspended over a vessel

containing mercury soon becomes white, in consequence of the evaporation of the latter. If a thin animal membrane be inserted between the two, the amalgamation ought to continue if the membrane allowed the vapors of mercury to permeate it. A glass vessel containing mercury was tied over with a piece of peritoneum, the external surface of the latter coated with leaf-gold, and the whole placed in a warm place. In three weeks the gold had not become amalgamated, nor did it become so when the mercury was heated to ebullition, and the internal surface of the peritoneal membrane was coated with globules of mercury.

This experiment shows, *that mercury does not penetrate animal membranes even in the gaseous state ; hence it cannot be taken up in the living body.* Some experiments made upon rabbits render it probable that the vapor of mercury, when inspired, condenses within the organs of respiration, there becoming oxidated by intimate contact with the air and gradually absorbed.

1. A rabbit was exposed in a capacious box during an hour to the vapor of boiling mercury. When it was taken out, it crawled with difficulty, and its breathing was very quick, but in the course of the day it recovered itself. The next morning it appeared to be in a very great state of uneasiness. It was again exposed to the vapor of mercury for an hour and a half. Soon afterwards it was seized with tetanic spasms, and died at the third seizure. On dissection, the mucous membrane of the trachea and bronchi was found strongly injected, and the bronchi mucous contained globules of mercury. In the lungs, numerous spots of hyperæmia were found; they varied in size from that of a lentil to a pin's head; also several larger red and gray spots, between which the substance of the lung was in a state of hepatization. By the aid of a lens and the microscope, the nuclei of several of these hyperæmic and hepatized portions were seen to be formed by globules of mercury. This experiment, when repeated several times, always gave the same result.

2. A rabbit was exposed for half an hour to the vapor of mercury. In the course of the day it seemed very dull, did not eat, breathed quickly, and was in a constant tremble; on the following day it was active, and remained so until the fourth day, when it was killed. The bronchial mucous membrane was unchanged;

the lungs contained numerous white spots, resembling miliary tubercles, partly surrounded by a hyperæmic line. The microscope detected in the spots granulated cells resembling pus-corpuscles, but no globules of mercury. The other organs were altered as in the preceding experiment.

3. A rabbit was enclosed in a capacious cage, in which a porcelain trough, 1 foot long and 9 inches in breadth, full of mercury, was placed. The temperature of the room was about 30° Fahrenheit. During the first fourteen days no change was perceptible; it then however lost its liveliness, sat in a crouching position, and lost its appetite. It gradually became constantly duller and the respiration quicker; on the twentieth day it dragged its hind legs along; it had a diarrhœa of blackish-brown matter, and on the twenty-second day it was dead. The blood was found loosely coagulated, the stomach and intestines were greatly distended, and the large intestine contained black liquid fecal matter. The substance of the lung was everywhere compact, and studded with small white spots resembling miliary tubercles and isolated sugillations of the size of a lentil. No globules of mercury could be found.

These experiments prove that the vapor of mercury condenses upon the mucous membrane of the air-passages and in the air-cells of the lungs to globules, there causing inflammation and lobular hepatization; that the mercury subsequently disappears from here; and that after the long-continued action of the vapors of mercury, the phenomena of mercurialization are developed. The experiments have certainly not shown the manner in which the solution and absorption of the globules of mercury take place. We can only assert thus much, that this cannot possibly occur without previous oxidation.

The results to which the preceding experiments have led may be summed up as follows:—

1. Metallic mercury is not capable of permeating animal membranes either in the finely-divided or gaseous state.

2. On triturating mercury with various substances, a small quantity of protoxide of mercury is formed, and this is the sole active constituent of the blue ointment and several other preparations.

3. The action of the blue ointment is uncertain, because the

quantity of oxide contained in it varies according to its age and the mode of preparation.

4. Hence a more uniform and effective preparation can be made from the pure protoxide.

5. Vapors of mercury first produce inflammation of the lungs, subsequently oxidation and absorption take place, and the symptoms of mercurialism commence.—*Jour. für. Prakt. Chem.* No. 9, 1850.—*London Chemical Gazette*, Sept. 1st, 1850.

ON COLD WATER AS A SOLVENT OF THE ACTIVE PRINCIPLES OF DRUGS.

BY MR. RICHARD BATTLE.

In the preparation of medicines, there are a few points to which I have especially directed my attention, and to which I shall take this opportunity of inviting your attention, believing that the conclusions to which I have come, suggest the general introduction of a new form of medicine, and of an important alteration and improvement in one now in common use.

1. The superiority of cold to boiling water as a menstruum for nearly all vegetable substances.
2. The quantity of water to be employed.
3. The extent to which the evaporation of the product can be safely and advantageously carried.

1. The object of the various menstrua employed, as hot and cold water, spirit, ether, vinegar, &c., is of course to dissolve the active principles with as little as possible of the inert constituents, which not only do not improve, but often greatly impair the properties of the medicine. I believe I have employed cold distilled water for this purpose far more largely than has been customary in this country or elsewhere; but the Edinburgh and Paris Pharmacopœias have, in their last editions, adopted it to a much greater extent than formerly. The advantages of cold water, that is, of water at the ordinary temperature of the laboratory, say 60 or 65, are, first, that it dissolves from the tissue of plants, in two or three macerations, all or nearly all the active principles soluble in boiling water, spirit, or ether, taking up even resin abundantly

when mixed with gum, the possibility of which, even out of the tissue, was long ago shown by the late Dr. Babington ; secondly, that it does not dissipate, but retains the volatile matter ; and, leaves behind the starch. Extracts prepared from such infusions are more aromatic, more transparent, more soluble, and less liable to decomposition. If it is objected that the produce is often considerably larger when the temperature is employed, I admit it. So also is the bulk of scammony when adulterated with flour and chalk. But virgin scammony has not a greater superiority over the adulterated drug than has the high flavored, soluble, translucent product of cold maceration over the nauseous, half-soluble, hard, opaque, starchy extract produced by boiling.

2. The quantity of cold water is also important. I have been led to adopt as a rule of maceration of most substances, twice their weight of cold distilled water, adding for each subsequent maceration as much additional distilled water as the amount of infusion previously drained off or expressed. To be thoroughly saturated with this small quantity of fluid, the article must be coarsely powdered, bruised, or cut into small pieces, and repeatedly pressed into the fluid with a rammer or with the hand. The specific gravity of the infusion seldom increases after four or six hours maceration. In some cases, as roots, leaves, hop, colocynth, &c., strong pressure is absolutely necessary to displace the fluid : but in the case of barks coarsely powdered, three fifths of the fluid will generally drain off without pressure, if time be allowed. If a larger quantity of water is employed in maceration, the additional matter taken up is chiefly gum and other inactive principles, and the medicine is both weakened and impaired by their addition, and is liable to become further deteriorated by the longer continuance of the heat required to get rid of the superfluous water.

3. To preserve watery extracts and for the convenience of exhibition, it has been customary to reduce them to a pilular consistence. To this there are serious objections. Extractive matter is rendered less soluble by the separation of its water, and by the heat required for its evaporation ; and the constituents, by being brought into too close contact, form new and often very soluble compounds, and continue to do so long after the completion of the extract, until the properties and value of the medicine are mate-

rially changed. To guard against these changes and to preserve the solubility of the extractive matter, I introduced in 1818, the form of Liquor, or inspissated cold infusion, evaporating the cold infusion at a temperature not exceeding 160° , to the specific gravity of 1200, and afterwards, to preserve this liquid extract from decomposition, adding to it as much rectified spirit as will reduce the specific gravity to 1100.

These liquors, of which I have prepared about twenty kinds, have been largely employed for many years, and the constant demand for them may be offered as evidence of the satisfaction they have given, of which satisfaction I have also received from all quarters the most ample assurance.

Believing then confidently that cold water is capable of producing the most elegant and useful preparations of vegetable substances, I am very anxious to impress on you the conviction to which I have been led by the constant superintendence of the operations of the laboratory, conducted under my own eye, and mostly by my own hands.

Should this form of medicine hereafter be adopted into the Pharmacopœia, it will be found that though the process is extremely simple, much care and attention are necessary to produce the proper result. Above all, the evaporation should be conducted at a temperature not exceeding 160° , and continued until the specific gravity reaches 1200, in order to secure the same uniformity in the result, which is obtained by reducing the extract to pilular consistence. The evaporation of the infusions to a definite quantity would have a very different result; for one sample of a drug will often yield to water two or three times as much as another.—*Phar. Journal and Trans. Sept. 1, 1850.*

ON THE INCOMPATIBILITIES OF IODINE AND IODIDE OF POTASSIUM.

BY M. DORVAULT.

M. Dorvault believes that an enumeration of the chief substances with which *iodine* is compatible may be of service. Among the metalloids, chlorine, bromine, sulphur, and phosphorus, and

among the metals, antimony, copper, lead, mercury, bismuth, silver, and gold, combine with iodine, and give birth to compounds in which its dynamic action is more or less modified. To the above may be added, with the same remark, those with which soluble iodides are formed, as iron, manganese, and zinc. Among the incompatible chemical compounds are ammonia, with which it produces an explosive compound, and sulphohydric and cyanhydric acids, which it decomposes, transforming itself into iodhydric acid. Nitric acid oxidizes it. Moist sulphurous and arsenious acids, brought into contact with it, become super-oxygenated while it is hydrogenised. It gives various results with the metallic oxides, properly so called, but usually produces insoluble iodides. From sulphates it liberates the sulphur and siezes the metal. From the salts of antimony, copper, mercury, silver, &c., it forms insoluble iodides with their metals. Almost all organized substances may be considered incompatible, in consequence of the tendency which this body has to sieze the hydrogen, giving rise to various compounds, of which iodhydric acid almost always forms part. Yet the iodine taken in this form into the economy retains in a great measure its dynamic action. Thus for the purpose of moderating the irritating action of iodine, or the salts of morphia, belladonna, &c., are often added; and experience teaches us, that in spite of the incompatibility of the alkaloids with iodine, the action of this substance is obtained. Still there can be no doubt that its activity is diminished from this cause.

The metals already named also produce insoluble iodides with *iodide of potassium*. If the iodine is in small quantities, potash is produced, and a double iodide if in large. The salts of these metals give rise to a double decomposition, producing a soluble salt of potassa, and an insoluble iodide. *Organic* incompatibilities are much less frequent than in the case of iodine, as the avidity which this substance has for combination is already satisfied with the potassa. Apart from the acids, as the citric, acetic, and tartaric, there are not any organic substances manifestly incompatible with the iodide of potassium.

By reason of the incompatibility of silver with iodine and iodide of potassium, pills should never be silvered, nor should medicine be administered by means of silver spoons.

Some of the reactions may occur in the system itself, if the iodine be ingested or applied soon after other medicines chemically incompatible with it, and *vice versa*; and in some instances, the system remains impregnated for some days with the prior medicine. All those bodies which have the power of becoming localized in certain organs, and those which stagnate in the economy by virtue of their combination with its protein elements, among which are mercury, antimony, arsenic, &c., give rise to this phenomenon. Thus, if we give a preparation of iodine after a mercurial salt, we salivate. So, too, by external friction with iodine, after the use of mercurial ointment, or the *Empl. Vigo*, vesication of the skin is induced. In both cases iodide of mercury has formed, and beside this, caustic potass. Ignorant of this, many persons order a combination of iodide of potassium and mercurial ointment, whereas when the action of the two is required, we should employ the iodide of mercury, or associate the iodide of potassium with mercury already in a state of combination as a salt.

In some cases, the production of incompatible compounds by the administration of preparations of iodine, fulfils a well-defined therapeutical indication, as when they are given in the case of metallic poisoning.—*Bull de Thèrap.*, tom. xxxviii, pp. 414-7.—*Med. Chir. Rev.* July, 1850.

ON COLOCYNTHINE.

By MR. WILLIAM BASTICK.

It must be a matter of surprise that the active principle of the pulp of the *Cucumis Colocynthis*, a drug in such extensive use and so highly esteemed, should not have received from Chemists a more complete examination to establish its true character. The medical prescriber might find in it an eligible agent when desirous of administering a powerful purgative in various concentrated forms.

It is to be regretted that it has been never submitted to ultimate analysis, consequently its precise composition is unknown. It is, probably, an *oxyhydro-carbon* analogous to the resins, although dif-

fering from them in several of its properties, so as to induce the belief that it is a body *sui generis*.

Colocynthine is more soluble in water than resin; it is, like them, highly inflammable. It is an oily fluid at a temperature below the boiling-point of water, of a pale yellow color; but at an ordinary temperature it solidifies into a reddish-brown resinous body. When dissolved in weak acids and alkalies, it separates unchanged upon the evaporation of the solution. It is not volatile when isolated, as might be supposed from the experience of those who have been engaged in preparing extract of colocynth, although in any form it is intensely bitter.

Colocynthine possesses neither basic nor acid properties, although Vauquelin and others have assumed to the contrary, having obtained a precipitate in its aqueous solutions by some metallic salts. But this reaction most likely arose from the colocynthine not being absolutely pure on which they experimented, as I do not find that it is thus effected when prepared according to a process which I have devised and found unobjectionable. Moreover, this method of preparation is incompatible with the existence of such a property.

The process I recommend is as follows:—Exhaust with successive portions of cold distilled water the pulp of colocynth previously freed from the seeds, until the pulp is deprived of its bitterness; filter the solution, and heat it to the boiling point; add, whilst hot, diacetate of lead, until no further precipitation ensues; when cold, filter, and to the clear liquid add diluted sulphuric acid carefully as long as a precipitate is thrown down; again boil to remove the free acetic acid, and filter to separate the sulphate of lead. By this means all the organic matter, except the colocynthine, is removed. Evaporate the filtrate cautiously to near dryness, and dissolve the colocynthine out of the residuum by means of strong alcohol, which leaves the salts undissolved as sulphates. By evaporating the alcoholic solution the colocynthine may be obtained pure.

This process is more complex than those recommended by Vauquelin and Braconnot; but, nevertheless, it is easy of execution. Colocynthine dissolves in strong sulphuric acid, but evidently is at the same time decomposed. The solution is dark brown, and upon being diluted with water a precipitate of a carbonaceous nature is

formed. The acid seems to deprive the colocythine of the elements of water.

Nitric acid produces a reaction with it that is analogous to the resins. It dissolves readily in cold nitric acid of the specific gravity 1.450, and after a few moments a vehement reaction ensues, attended with the evolution of great heat and fumes of nitrous acid, which shows that this body is oxidized when thus treated.

By mixing a moderate quantity of water with the acid solution, a voluminous precipitate is formed, which is redissolved by the addition of more water. This precipitate, when separated by a filter from the liquid and washed with ice-cold water to remove the excess of nitric acid is found to have the characteristics of a weak acid (colocynthic acid ?) It seems to be the only product of the oxidation of the colocythine when thus conducted, although other bodies, doubtless, are formed by continuing the process of oxidation under the application of heat. This acid is of a pale yellow color and bitter taste, but infinitely less bitter than colocythine. It is inflammable, but not explosive. It is soluble in water, alcohol, and ether, and separates by evaporation from its solutions in an uncrystalline condition. With ammonia, potash, and soda it produces soluble compounds of a reddish-brown color, but also uncrystallizable. It combines with the earths and metallic oxides, forming insoluble or slightly soluble compounds.

Dr. Gregory has suggested that colocythine is probably a mixture of organic bodies; but my investigation of its properties, as here detailed, does not seem to support this opinion.—*Pharm. Jour. Nov.*

VARIETIES OF LINT.

By JACOB BELL.

Editor of the [London] Pharmaceutical Journal.

Lint, as its name implies, is (or ought to be) prepared from linen. The course of preparation which it undergoes is intended to remove the harshness of the surface, rendering it soft, and suitable for application to wounds, as well as more absorbent.

Ordinary, or old-fashioned lint, of which there are several qualities, is usually made from old shirts, sheets, or other linen rags of

various kinds, which are collected for the purpose, and constitute an extensive branch of trade with the "rag and bottle dealers."—These rags are washed several times in soft soap and water, sometimes boiled with soda or pearlashes, and afterwards rinsed, first in blue water and lastly in clean water. Chloride of lime is, we believe, used by some lint makers to bleach the rags, but this is injurious to the texture and quality, and is avoided by the best makers, who depend entirely on soap and soda as detergents.

The rag, being well cleansed and dried, is next prepared by means of a machine resembling the framework of a small table without a top. To the back is fixed with a hinge, a lever, supported by a spring, and extending to the front, at which extremity it is furnished with a knife resembling a chopper, about eighteen inches long. The lever is alternately depressed by a string attached to a pedal, worked by the foot, and raised by the spring before mentioned. At each depression the knife impinges on the front of the frame, on which a strip of stout leather is attached. The rag is wound round a roller, and the edge of it brought forward on the leather under the knife. The knife is depressed, and at the same moment the rag is pulled back about the eighth of an inch. On the rising of the knife the rag is pushed forward to receive the next stroke, and the operation is repeated until all the fibres in one direction have been cut sufficiently to produce the desired surface. This operation, although it appears simple, requires some skill and experience, for unless all the fibres are cut uniformly, the surface will not be smooth, and if the knife be brought down with too much force the rag would be cut through. At this stage of the process the lint when well cut appears remarkably soft and fluffy, but not quite smooth. The ragged edges are then trimmed, the lint is mangled or passed through rollers, and carefully folded in packets for sale.

We have been favored with information on these practical details by Mr. Oyler, of No. 2, York Street, Camden Town, who is an extensive manufacturer of lint of the old kind, of every degree of fineness, from cambric to common sheeting. Of the cambric lint, of which Mr. Oyler gave us a sample, thirty-six yards (of eighteen inches wide) go to the pound, of the ordinary lint about four and a half yards, or when very thick and coarse, only three or

four yards. The qualities most desired in lint are softness, a smooth surface, and moderate thickness. It should tear readily in one direction, and hold firmly in the other. Some lint will tear also across the grain, and this kind is preferred by Surgeons for the pocket case, as it is convenient to be able to dress small wounds without using scissors. For general purposes it is sufficient that it tears in one direction. When required for dressing wounds and ordinary hospital practice, rather thin lint is preferred, but for the application of lotions or for other purposes, where absorbing qualities are desirable a thicker lint is better.

We have stated that lint is, or *ought to be*, prepared from linen. The lint is more absorbent and less irritating to an abraded surface. Although cotton lint is not unfrequently sold, either mixed with linen or substituted for it, a lint maker who has a character to lose would run the risk of injuring his business by indulging in the practice, and he loses no opportunity of reminding his customers that his lint "has not a bit of cotton in it." Cotton being much cheaper than linen, is used chiefly on this account by those who push their trade by "underselling," and take advantage of the inexperience of their customers in judging the quality. The linen rags collected for the manufacture of lint vary in texture, size, shape, and other qualities. Consequently, notwithstanding the care which is taken in the selection, there is scarcely to be met with a parcel of lint, even of the best quality, absolutely uniform. When the retailer has an order for a pound of large lint of a particular description, he must occasionally break open four or five pound packets to accommodate his customer. The source whence the old rags are derived has also been considered objectionable by persons who are at all fastidious; on which account various attempts have been made to introduce as a substitute a fabric of uniform texture and quality made on purpose. Hence the origin of several varieties of patent lint which have lately been in circulation. Of these we have before us

Tosswill's Patent Lint (two qualities, one finer than the other.)

Tipton's Patent Lint.

Wackerbath and Ross's "Superior Golden Flax Lint."

Taylor's Patent Lint (two kinds.)

Patent Lint, manufactured by the "National Linen Company."

Some of these lints are composed of linen, others of cotton. In order to give practical value to our description of each variety, we have furnished samples to two Metropolitan hospitals for trial, and hope to be favored with reports in time for our next number, when we intend to resume the subject.

It is probable that the above list may not include all the varieties which are in the market. If this be the case, we shall be glad to receive such information as may enable us to complete the investigation, it being our object to give a fair and impartial report of every kind of lint which is manufactured.—*Pharm. Jour.*

ON THE COMPOSITION AND METAMORPHOSES OF CONINE.

By J. BLYTH.

The recent analytical results of this chemist do not accord with those already obtained by M. Ortigosa. The difficulty of obtaining the alkaloid in a pure state is such that it is not easy to deduce a reliable formula except from the analyses of its saline combinations. From a careful comparison of the results, M. Gerhardt is led to obtain the formula already adopted by him in his *Precis* (vol. ii, p. 66) $C_8H_{15}N$, or in the ordinary notation, $C_{16}H_{30}N$; that of Mr. Blyth is $C_{17}H_{17}N$, and that of Ortigosa $C_{16}H_{16}N$, neither of which gives a number of equivalents of nitrogen and hydrogen divisible by 4. The results obtained by M. Ortigosa approach very closely to those calculated from M. Gerhardt's formula.

According to Mr. Blyth, the boiling point of conine is 168° – 171° C.; but it is altered by heat so that the temperature rises during the distillation. Its density is .878. It is volatile at ordinary temperatures, giving off a pungent odor which affects the eyes and produces white fumes with nitric, hydrochloric and acetic acids. In a dry state it does not affect test papers, but on the addition of a drop of water its reaction is strongly alkaline. Conine readily coagulates albumen, and precipitates the salts of Cu, Pb, Zn, Mn, Al and Fe, it precipitates also nitrate of silver but an excess of conine dissolves the precipitate; it dissolves the chloride of silver as readily as ammonia. Most of the salts of conine are decomposed by evaporation, leaving gummy residues: many of these are crystallizable as the hydrochlorate, but very deliquescent.

Conine is a very alterable substance and resinifies by the action of the air; the ordinary product of its oxydation is *butyric acid*, which is obtained from it in various ways,—by boiling a solution of the chloroplatinate, by acting upon it with an excess of bromine and evaporating in the product *in vacuo*, by chromic and nitric acids, etc. According to M. Gerhardt the reaction will be as follows

$$\text{C}_8 \text{H}_{15}\text{N} + 2\text{H}_2 \text{O} + \text{O}_2 = 2\text{C}_4 \text{H}_8 \text{O}_5 + \text{NH}_3.$$

Mr. Blyth supposes a simultaneous formation of carbonic acid which his formula demands.—*American Journal of Science and Arts*, Sept. 1850.

ON THE USE OF SULPHURET OF ARSENICUM AS A DEPILATORY.

By M. FELIX BOUDET.

The numerous cases of poisoning in which arsenic has been used caused the legislature, in 1845 and 1846, to impose certain restrictions upon the sale of this substance. In the latter year, a royal ordinance interdicted under severe penalties,

1st. The sale of arsenic and its compounds for other purposes than its use in medicine, unless in combination with other substances.

2d. The sale and use of arsenic and its compounds for the steeping of grain, the embalming of bodies, and the destruction of insects.

In consequence of these wise measures, the retail sale of arsenious acid has been suppressed, and this terrible poison, which not long since was in the hands of every agriculturist, is no longer entrusted to such hands. Science has bestowed a great benefit in depriving the perpetrators of crime of this formidable weapon. But there are other arsenical products almost equal in power to arsenious acid, which are still in use, such as the sulphurets of arsenic.

One of these, under the name of *orpin*, is used in a particular process for preparing sheep-skins. This is not orpiment, as its name would seem to indicate, but artificial or false realgar, which, according to Guibourt, contains one-and-a-half per cent. of arsenious acid, and is a tolerably active poison.

The other, under the name of *yellow sulphuret of arsenic*, enters

into the composition of indigo vats, and forms one of the constituents of depilatory powders and paste. This is the yellow arsenic or false orpiment, which is prepared in Germany by subliming arsenious acid with sulphur. It contains 94 per cent. of arsenious acid, and only six per cent. of sulphuret of arsenic. It is almost as poisonous as the arsenious acid itself. The annual importation of these two sulphurets into France, exceeds 660,000 pounds weight.

In the dressing of skins, the use of orpin has only been introduced during the last twenty years. It causes the wool to be detached from the skin, without plunging it into a bath of lime, as was the practice formerly, and in this respect it has been found very serviceable.

Having had occasion to direct my attention to some applications of chemistry to the art of tanning, and to substitute soda for lime in that process. I was also led to enquire into the use of orpin. It has appeared to me, for some time past, that this subject involved an important consideration in a sanitary point of view.

The poisonous properties of sulphuret of arsenic, the facility with which it has been obtained by retail consumers, the great quantity of it which, in Paris, has been daily poured into the river Bievre, are circumstances calculated to create serious inquietude. Indeed, I have lately heard from M. Bussy, that in 1846, whilst making some experiments relating to a Report to a Commission of Health, he had obtained arsenical stains by Marsh's apparatus, from the mud procured from the bottom of the river Bievre, and also that of the Seine, taken from beneath the bridge of Austerlitz. It is much to be desired that the sulphuret of arsenic could be replaced, as a depilatory, by some other less dangerous agent.

Hitherto the depilatory processes had not been submitted to any scientific investigation; and if, according to Berzelius, we ought to attribute the effects of the mixture of lime and sulphuret of arsenic to the solubility of the skins in caustic alkali, this question, upon which doubt is thrown by this illustrious Chemist, leaves unexplained the preference given to the above mixture over the use of lime alone.

I had, therefore, to ascertain which was really the depilatory agent, and whether the arsenic performed an important part in the process.

In order to solve this problem, I examined separately the proper-

ties of each of the compounds which might exist or be produced in the mixture of sulphuret of arsenic, lime and water, which was applied to sheep-skins for the purpose of removing the wool; and I then discovered that neither the lime, nor the arsenious acid, nor the sulphuret of arsenic had any notable influence on the result, but that this depended on the action of nascent sulphuret of calcium formed by the reaction of lime on the sulphuret of arsenic.

I proved, indeed, that sulphuret of calcium acts powerfully as a depilatory when employed alone, and that it partakes of this property in common with the monosulphurets of sodium, of barium, and of strontium.

These observations naturally suggested the substitution of sulphuret of sodium, or hydrosulphate of soda for the sulphuret of arsenic, the former having been already introduced as a therapeutical agent, and especially in the fabrication of mineral waters and sulphur baths. This new agent succeeded beyond my hopes, and gave more rapid results than the orpin itself; so much so that only a few hours after its application to a sheep-skin I could without effort detach the wool in a single piece.

Nothing, could, therefore, be easier than to substitute sulphuret of sodium for sulphuret of arsenic in depilatory processes. The expense of the process would not be thereby increased, and both with reference to the health of the workmen engaged in making, powdering and applying the orpin, and the security of the public who are interested in restricting the use of substances which might be productive of poisonous effects, such a substitute would be very desirable.

Encouraged by this first success my attention was directed to the depilatory powders and pastes, which are extensively used in the East, and not unfrequently in France, for removing superfluous hairs.

The Turkish *rusma*, and the depilatories of Plenck, of Colley, and of Delcroix, may all be described as mixtures in different proportions of lime and sulphuret of arsenic, to which some add gum, and others starch, and sometimes a little caustic alkali; and these preparations are applied to the skin after being made into a paste with a little water.

These means do not always answer the intended purpose well, and their adoption is subject to serious evils.

In fact, the yellow sulphuret of arsenic being, as has been stated little else than arsenious acid, the application to the naked skin of so energetic an agent cannot be free from danger. Even the preparation of these depilatory powders is fraught with danger, as it is generally performed by persons wholly unacquainted with chemical or pharmaceutical knowledge.

But my investigations have shown that in all these depilatories, as well as in those used by the leather dressers, the arsenious acid has no influence in promoting the required effect, which might be more rapidly and certainly produced by the use of a paste of sulphuret of sodium and lime than with any one of the arsenical compounds which have been hitherto used.

The following is the formula which I propose :—

Take of

Sulphuret of Sodium, or	}	3 parts
Hydrosulphate of Soda, crystalized		
Quick Lime, in powder - - - -	10	“
Starch - - - - -	10	“ Mix.

This powder, mixed with a little water, and applied over the skin, acts so rapidly as a depilatory, that if it be removed in a minute or two after its application, by means of a wooden knife, the surface of the skin will be entirely deprived of hair. By this process the removal of the hair becomes so simple, rapid, and safe an operation, that it will probably supercede the use of the razor in many cases. Hitherto, the tediousness and uncertainty of the process, and above all the poisonous properties of the agents employed as depilatories have greatly limited their use, but it is easy to foresee the numerous cases to which a process made easy and safe might be applied. Independently of the advantages which it presents in the removal of superfluous hair, may it not be of great service to medical men and surgeons in connection with the application of blisters or epithems, and also in certain operations?

It may be applied to parts the most delicate as well as irregular, and to surfaces either limited or extended, and it is only after several days that the hair begins to reappear.—*Journal de Pharmacie*, and *London Pharm. Trans.* Oct. 1, 1850.

ON THE PREPARATION OF SUGAR OF LEAD WITH PYROLIGNOUS ACID.

BY G. SCHNEDERMANN.

The pyrolignous acid employed for the manufacture of sugar of lead ought to be tolerably free from empyreumatic substances in order to yield a good product. The manufacturers of pyrolignous acid furnish (often under the name of muriate of lead) a product which is very brown by these empyreumatic admixtures, and which is prepared by saturating rectified pyrolignous acid with litharge. In dyeing and printing, sugar of lead is chiefly used for the preparation of acetate of alumina; but as impure sugar of lead is prejudicial to the more delicate colors, pure sugar of lead, prepared from alcohol vinegar, can alone be employed for these, as well as for chrome-yellow, chrome-orange, &c.

Prof. Schnedermann, of Chemnitz, has discovered a method by which the sugar of lead may be obtained from pyrolignous acid in a sufficient state of purity for dyeing purposes. The rough pyrolignous acid is rectified in the usual manner, then super-saturated with slaked lime, and exposed to the air for twenty-four hours, during which time the mass is to be frequently stirred up. By the excess of lime, a great part of the empyreumatic matter, which forms with the lime a more or less brown and insoluble combination, is precipitated. The exposure to the air is necessary, because the empyreumatic matters become more oxydized, assume a deeper color, and become fitted for combining with lime. The brown solution of the acetate of lime is then separated in a suitable manner from the precipitate, and heated to boiling, when small quantities of a clear solution of chloride of lime are successively added as long as the liquid continues to become paler. After evaporating to dryness, the yellowish-gray residue, which consists of acetate of lime, with a small proportion of chloride of calcium, is decomposed by sulphuric acid. If the acetic acid be intended to be obtained by distillation from this mixture, the sulphuric acid must be diluted with an equal volume of water.

In other cases, the sulphuric acid is not at all to be diluted, or only very slightly so, and added gradually to the decomposed residue, to avoid the generation of heat. The mixture is left standing for a short time; it is then to be diluted with water, and the clear

liquid drawn off from the gypsum. In this case it is not advisable to previously dilute the sulphuric acid with water, as the gypsum then assumes a crystalline loose condition, subsides with difficulty, and contains much fluid.

In both cases the acetic acid contains a small quantity of muriatic acid, also sulphurous acid; and, in the latter case, also a small proportion of gypsum. Oxide of lead is now to be added, and heat applied till the acid reaction is feeble. The precipitate retains sulphurous acid from the gypsum, and also sulphate of lead, and chloride of lead. The solution of the acetate of lead yields a yellowish sugar of lead, containing a small quantity of chloride of lead, but which is generally sufficiently pure for dyeing purposes, and can be still further purified by recrystallization.—*Pharm. Journal, from Dingler's Polyt. Journal and Pharm. Central Blatt, 1850, p. 317.*

MINUTES OF THE PHILADELPHIA COLLEGE OF PHARMACY.

At a stated meeting of the Philadelphia College of Pharmacy, held Ninth month 30, 1850. Present seventeen members. Daniel B. Smith, President, in the Chair.

The minutes of the Board of Trustees informed that the degree of graduate in pharmacy, had been conferred on the seventeen graduates of 1849 and 1850, and that an address had been delivered on the occasion, by Professor Bridges. Edmund A. Crenshaw has also been elected a resident member.

The Committee on the Adulteration of Drugs, not being prepared to make a final report, are continued.

The Committee on the Revision of the Pharmacopœia, reported that they had attended to the remaining part of their duty, and forwarded the result of their labors to Washington, to be submitted to the National Convention. The Committee are discharged from the further consideration of the subject.

The delegation appointed to represent the College in the National Convention, held at Washington, to effect the Revision of the United States Pharmacopœia, reported they all attended, that the Report of the Committee of Revision was duly presented, and that the influence of the Philadelphia College of Pharmacy was felt in the Convention.

The Committee on the Cabinet of Specimens made the following report, and were released from further attention to the subject:

“That since their last communication, they have expended the appropriations made at that time, as will be seen by the annexed statement, and that they have filled up all the glass ware with specimens, chiefly those of materia medica, without any cost to the College. The Committee believe that a small appropriation, to be devoted to the purchase of a further supply of glass ware, would be attended with advantage, as they believe many more valuable specimens, especially chemicals, can be obtained without cost, if appropriate places of deposit were in the cases. The Committee now ask to be discharged, believing, that the further enlargement of the Cabinet, and the expenditure of the appropriation, should the College think proper to make it now, or at a future time, can be as well made by the Standing Committee on the Cabinet.

SAMUEL F. TROTH,

WILLIAM PROCTER, JR.,

On behalf of the Committee.

Ninth Month, 30th 1850.”

The expenses of the Committee being submitted, they were on motion ordered to be paid.

On motion of Ambrose Smith, the Board of Trustees are requested to take measures for exchanging specimens of native plants and materia medica with foreign pharmaceutical societies.

The College proceeded to the election of eight trustees. Alfred B. Taylor and Jacob L. Smith, were appointed tellers, who represented that the following members were unanimously elected, viz:—

Thomas P. James,

Jacob L. Smith,

Alfred B. Taylor,

John Harris,

Then adjourned.

Wm. J. Jenks,

Joseph Trimble,

Charles Bullock,

Henry C. Blair.

DILLWYN PARRISH, Secretary.

Varieties.

Californian Quicksilver.—It is not improbable that gold may be found to constitute but a small proportion of the wealth derivable from California. It has for some time past been known that quicksilver abounds in that locality to an enormous extent. About twelve months ago a capitalist embarked with the requisite machinery for working a mine, and the result has more than realised his most sanguine expectations. On his return to England in quest of additional machinery, we are informed that he found a letter from the great Rothschild—the present mercury monopolist—requesting an interview with him in London—for what purpose it is easy to guess. We believe this request was not acceded to. The reports respecting the extent of the supply in the new mines are almost incredible. We have been informed that within a few weeks of the commencement of operations by the party alluded to, assisted by five men, a quantity of mercury was raised equal in value to £100,000 at the present market price. Even allowing a large discount for exaggeration, there is no reason to doubt that the supply is almost unlimited, and that the metal can be profitably sold at less than half its present price. The silver mines in Mexico, which have for years been unproductive, on account of the prohibitory price of mercury, may now be supplied on reasonable terms, and every branch of trade and manufacture in which mercury is used, will acquire a similar stimulus.—*Pharmaceutical Journal*, November 1, 1850.

Consumption of Spirits in Great Britain.—According to a return recently made, the total number of gallons of proof spirits distilled in the United Kingdom during the year ending January 5, 1850, was 24,775,128, distributed among the three kingdoms thus:—England, 5,573,411 gallons, of which 5,362,600 were from malt with unmalted grain, 17,337 from sugar or molasses with unmalted grain, 13,931 from sugar, and 176,533 from molasses; Scotland 10,846,634 gallons, of which 6,058,086 were from malt only, 4,788,548 from malt with unmalted grain; Ireland 8,355,883 gallons, of which 85,756 were from malt only, 8,047,077 from malt with unmalted grain, and 222,250 from sugar or molasses with unmalted grain. The number of gallons of proof spirit on which duty was paid for home consumption in the United Kingdom was 22,962,012, the total amount of duty being £5,747,218 1s., distributed as follows:—England, 675,036 gallons from malt only, 8,166,226 from malt mixed with unmalted grain, 14,740 from sugar, and 171,052 from molasses; total, 9,053,676 gallons, on which £3,546,023 2s. duty was paid, at the rate of 7s. 10d. per gallon; Scotland 4,950,736 gallons from malt only, 1,984,115 from malt mixed with unmalted grain, and 152 from sugar; total, 6,035,003 gallons, on which the duty at 3s. 8d. per

gallon amounted to £1,271,417 4s. 4d.; Ireland, 452,468 gallons from malt only, 6,404,770 from malt mixed with unmalted grain, 112,308 from sugar or molasses with unmalted grain, and 3,787 from sugar; total, 6,973,333 gallons, yielding at the rate of 2s. 8d. per gallon, an amount of duty equal to £929,777 14s. 8d.—*Pharmaceutical Journal*, July 1, 1850.

Runge's Chrome Ink.—Runge's chrome ink, which consists of the neutral chromate of potash, and an extract of logwood, becomes, according to Stein, perfectly permanent, and of a more intense black color, by the addition of a few drops of a solution of corrosive sublimate.—*Pharmaceutical Journal*, June 1, from *Pharm. Central Blatt*, 1850, No. 12.

Ready Method of preparing Helenine. By W. DELFFS.—When the fresh root of *Inula Helenium*, cut in slices, is exhausted with boiling alcohol of 0.833 spec. grav., and the hot filtered solution is mixed with from 3 to 4 times its bulk of cold water, a slight turbidness results; and after twenty-four hours, dazzling white needles, several inches in length, of pure helenine, will be found in the liquid. The mother-liquor retains so little helenine, that it is scarcely worth while evaporating it. The experiment also succeeded with the dried root which had been kept for half a year, but the produce appeared to be smaller. The root employed for these experiments had been collected towards the end of October.—*Chemical Gazette*, October 1, 1850, from Poggendorff's *Annalen*, 1850, No. vii.

On the Detection of Strychnine. By A. W. BRIEGER.—The reaction of substances containing much oxygen upon strychnine is very distinct with pure chromic acid, far more so than with the bichromate of potash, first recommended for the purpose by Otto. By means of this reaction it is possible to detect strychnine when mixed with santonine, brucine, &c. But several substances prevent the appearance of the violet color more or less, for instance pure or acetate of morphine; quinine renders the color pale rose-red; sugar conceals the reaction.—*Ibid*, from *Jahrb. fur Prakt. Pharm.* xx. p. 87.

On the Constitution of Styracine. By Dr. A. STRECKER.—I recently advanced the view, based upon the experiments of M. Toel, that styracine is a compound of *cinnamic acid* with the *alcohol of cinnamic acid* (styrone.) All the facts related by M. Toel and the analyses of the different products, agree well with the formulæ proposed by me, with the exception of the analyses of styracine, which in part at least accord better with M. Toel's formula. To get information on this point, I prepared some styracine, and obtained it perfectly pure by repeated crystallization from alcohol and ether. It possessed all the properties ascribed to pure styracine by M. Toel. After drying over sulphuric acid, it was burnt with chromate of lead, when it gave—

Carbon	81.47	81.37	36 = 216	81.82
Hydrogen	6.09	6.06	16 16	6.06
Oxygen	. .	. .	4 32	12.12

The slight loss in carbon was to be expected in the combustion of a substance so rich in carbon, unless oxygen were employed; the principle object however was an accurate determination of the quantity of hydrogen, which according to the formula $C^{30} H^{14} O^3$ should amount to 6.42 per cent. I think therefore that the formula $C^{36} H^{16} O^1$ for styracine may be considered as established.—*Chemical Gazette*, August 15, 1850, from *Liebig's Annalen*, April, 1850.

Note on Scillitine. By L. F. BLEY.—The author has obtained scillitine in a crystalline state, according to Lebourdais's process, by treating the aqueous extract of squills with animal charcoal. The author treated the extract of 16 oz. of squills with 12 oz. of purified animal charcoal, without any application of heat; the solution lost entirely its bitter taste. The dry charcoal was now exhausted with hot alcohol, and from this solution a small quantity of scillitine was obtained by spontaneous evaporation in long flexible needles.

The temperature at which the solution of the scillitine, from which half the alcohol had been removed by distillation, was evaporated, did not exceed 77° F. At a higher temperature it was obtained at first in oily drops, which congealed to a wax-like mass, and could not be subsequently crystallized. It must consequently have experienced some alteration, for the solution of the crystalline scillitine is neutral, and renders water turbid when added to it in drops, whilst that of the non-crystalline is acid, and does not render the water turbid.—*Chemical Gazette*, July 15, 1850, from *Archiv. der Pharm.*, lxi. p. 141.

On the Presence of Iodide of Cyanogen in Commercial Iodine. By T. KLOBACH.—The occurrence of iodide of cyanogen in commercial iodine had been previously noticed by F. Meyer. The author likewise observed crystals of this compound in the first crop on the sublimation of 80 lbs. of iodine. It was distilled with mercury to remove the free iodine, when 12 oz. of iodide of cyanogen, in beautiful crystals, were obtained.—*Chemical Gazette*, April 15, 1850, from *Archiv. der Pharm.*, lx. p. 34.

The Salts of Morphia.—M. Mialhe, of Paris, is of opinion that opium, either in the shape of extract or tincture, ought to be entirely discarded from practice, as the proportion of active principles in this drug is extremely uncertain, both from natural causes, and through adulterations. He has found that in the various kinds of opium of commerce, morphia varies from seven grains and a half to eight scruples per three ounces and a half; or in other words, from one-half to ten per cent. In adulterated specimens—namely in a substance that merely imitated opium—he has found only six parts of morphia in 5000. M. Mialhe infers that morphia alone should be used in medicine, and that this principle should drive away opium, as quinine has replaced bark—*Boston Med. and Surg. Jour.*, November 6, 1850, from *London Lancet*.

The Artesian Well of Bavaria.—A correspondent of the National Intelligencer, writing from Paris, says, "The famous Artesian well at Kissengen, in Bavaria, commenced eighteen years ago, and which it was feared would have to be abandoned as a failure, has just given the most satisfactory results. The town is located in a saline valley, 984 feet above the level of the Baltic sea. Last June, the boring had reached a depth of 1837 feet, and several layers of salt, separated by a stratum of granite, had been traversed, when carbonic acid gas, followed again by granite, was found. Finally, on the 12th inst., at a depth of 2067 feet, perseverance was rewarded by complete success. A violent explosion burst away the scaffolding built to facilitate the operations, and a column of water four and a half inches in diameter spouted forth to the height of 98 feet above the surface. The water—clear as crystal—is of a temperature of 66 Fahrenheit, and is abundantly charged with salt. It is calculated that the product will be upwards of 6,000,000 lbs. per annum, increasing the royal revenues by 3,000,000 florins, after deducting all expenses."—*Boston Med. and Surg Journal*, November 27, 1850.

Prussiate of Potash in Asthma.—It is understood that much relief has been obtained from the use of prussiate of potash in the paroxysms of asthmatic breathing. The dose, during a paroxysm, is one teaspoonful of a saturated solution. The principle upon which its remedial properties are based, is that of its being an arterial sedative. It is a ferro-cyanuret of potassium, and probably the hydrocyanic acid is the medicant after all.—*Ibid.*

On Kermes Mineral as an Antidote to Strychnia. Ry M. THOREL.—M. Thorel, taking advantage of the practice of the municipal authorities in destroying stray dogs periodically by means of strychnia and nux vomica, instituted some experiments upon the antidotal power of kermes, having already observed the reactions which ensue on bringing a sulphuret in contact with strychnia. Although dogs commencing to exhibit the symptoms of strychnia poisoning cannot, if they have been fasting, be made to vomit even by large doses of tartar emetic; yet by combining with it some kermes, free purging and vomiting are produced, and if the space of time has not been too prolonged the animal recovers. He believes that the instances in which he tried it justify him in recommending, that in cases of poisoning by strychnia in the human subject, the following dose should be given:—*Kermes* 15 grains, *Tart. Emet.* gr. 1½, water and syrup of buckthorn, 2 oz. A second or even a third may be given.

A series of chemical experiments lead him to the conclusion that the action of the substance is twofold. A portion is decomposed, and forms, with the strychnia existing in the stomach as a lactate of strychnia, an insoluble sulphuret, while the undecomposed portion aids the tartar emetic in inducing expulsive action.

MM. Bouchardat and Gobley, reporting on this paper, regard it as of some importance. They observe, however, that experiments out of the body show that the iodated iodide of potassium (*iodure de potassium iodurée*) exerts a far more powerful effect in precipitating an absolutely insoluble compound with

strychnia, than kermes does. The relative efficacy of the two substances can only be tested by experience: the experiments on animals require to be extensively repeated, lest we may be deceived by exceptional circumstances. It is possible that all the advantages in M. Thorel's arose from the evacua- which were induced by the antimony and buckthorn.—*The British and Foreign Medico-Chirurgical Review*, July, 1850, from *Journal de Pharmacie et de Chimie*, 8 Sér., xvii, pp. 185-91.

On the destruction of the Odor of Musk by Camphor. By M. FLEISCHMANN.—The fact of musk, when mixed with other substances (as sulph., antim., aurat., syrup of almonds, wax, &c.,) almost entirely losing its odor, has often been observed; but the attention of M. Fleischmann has been recently more particularly drawn to the subject, by his finding that a powder, composed of musk, camphor, and sugar, lost its odor after mixing. Repeating the experiment, he found that, as often as camphor was commingled with musk, it exerted this effect upon it; so, too, when musk was given with an oleo-saccharum, as cinnamon, &c., its odor became lost.—*Ibid* from *Buckner's Report.*, Band iv. p. 262.

Adulteration of Quinine.—Stresemann has observed adulterations of quinine with from 30 to 40 per cent of salicine; Skeyde, with from 10 to 18 per cent of sugar and milk: and Winckler, with 40 per cent of chalk.—*Ibid* from *Liebig's Report*, p. 475.

On the Saffron of the East. By X. LANDERER, of Athens.—On the Continent, as well as on the islands of the Archipelago, the stigmata of *Crocus Spruneri*, *sativus*, *vernus*, *luteus*, and *variegatus* are gathered and sold as saffron (*Safora*.) In the whole of Greece, about 30 to 40 pounds are annually gathered of it; but much more is brought from Macedonia and Thracia, where the saffron is said to be taken from the *Crocus aureus*, but mixed with the petals of *Crocus* and *Calendula*. It is sold in the bazaars of Smyrna, Thessalonica, and Gallipolis, a large quantity of saffron, about 30,000 litres annually, is brought by Persian small dealers to the so-called Misir-bazaars in Constantinople, i. e. the bazaars where all the products from the interior of Asia Minor, from Egypt, and from the Caucasus are sold.—*Pharmaceutical Journal*, October 1, 1850.

On a Compound of Iodine and Codeine. By T. ANDERSON, M. D.—The compound of iodine and codeine, which formed the special subject of this communication, is obtained by mixing together alcoholic solutions of equal quantities of codeine and iodine, and leaving the mixture to spontaneous evaporation, when the new compound is deposited in crystals. The compound is insoluble in water, sparingly soluble in cold alcohol, but readily in boiling, and it is again deposited in small triangular plates as the solution cools. Its crystalline form has been determined by Prof. Haidinger of

Vienna, who finds it to belong to the doubly oblique system. The crystals have a fine diamond lustre and a deeply purple color by reflected, and ruby-red by transmitted light. In powder, its color is cinnamon brown.—*Chem. Gaz.*, September 15, 1850.

Examination of Castoreum. By F. WOEHLE.—(*Ann. der Chem. und Pharm.*, lxxvii, 360.) The author had already suggested the existence of phenol in this substance, and has been able to verify it by distilling the castoreum with water, when a small portion of an oily liquid having all the reaction of phenol was obtained. The residue of this distillation yielded crystals of benzoic acid and salicine, and the mother liquid from the crystals of the benzoic acid gave with ferric salts the reactions of salicylic acid.—*Silliman's Journal*, September, 1850.

On Testing Opium. By G. REICH.—In testing opium to discover the proportion of morphine and narcotine which it contains, the author proceeds in the following manner:—About 100 grains of powdered opium are triturated with one ounce of spirit of wine of 78° , and digested in a glass vessel for several hours at a moderate heat, and the liquid filtered whilst hot. The digestion is then repeated with half an ounce of the same spirit, and the liquid again filtered whilst hot into a beaker-glass, containing a solution of carbonate of ammonia (twenty grains in sixty grains of water.) The liquid having been covered with a plate of glass, is to be left undisturbed for twenty-four hours, when crystals will have formed on the interior of the glass. When examined by the microscope the crystals are found to consist of four-sided rectangular small prisms, small pearly scales and needles, and four-sided prisms. The crystals, therefore, are a mixture of morphia, narcotine, and meconate of ammonia. They are to be collected on a filter, the meconate of ammonia removed by repeated washing with distilled water; the crystals, together with the filter, dried on the funnel and treated with absolute ether, by which they are deprived of the narcotine. The morphia remains on the filter, and the narcotine is obtained by spontaneous evaporation of the ethereal solution. By this method the author has discovered in opium 1.8 per cent of morphia and one per cent of narcotine.—*Pharmaceutical Journal*, July 1, 1850.

Congelation of Protoxide of Nitrogen and Alcohol. By M. DESPRETZ.—A portion of protoxide of nitrogen in the fluid state being poured into a platina capsule placed on a brick, under the receiver of an air-pump, became, by the first few strokes of the piston, covered with a white stratum, and was quickly converted into a snow-like mass of white substance. In a similar manner alcohol, mixed with protoxide of nitrogen, solid carbonic acid, and ether, was solidified, although imperfectly.—*Boston Medical and Surgical Journal*, November 6, 1850, from *L'Union Médicale*.

On Cod-liver Oil in Phthisis. By M. DUCLOS.—M. Duclos thus sums up the results of his experience with this substance. 1. The presence of fever

is what we must chiefly attend to, relying more on this remedy when it is absent, and less when it is present. 2. The remedy frequently arrests the progress of the disease when only in the first stage. 3. It rarely arrests it when in the second stage, although it may retard it. 4. The third stage is not favorably influenced by the oil. 5. The oil should be administered for a considerable time; and, if a good effect results, it should be suspended awhile, to be again resumed. Thus, it may be given for two months, and then suspended for a fortnight, resumed for a month, and re-suspended for a fortnight again, so as gradually to reduce the length of the intervals during which it is given. 6. The clear, slightly smelling, nearly tasteless oil, is less efficacious than the brown, thick, strong oil.—*British and Foreign Medico-Chirurgical Review*, October, 1850, from *Bull. de Thérapeutique*, xxxviii. p. 490.

On Linseed Oil in Hemorrhoids. By M. VAN RYN.—M. Van Ryn believes, that, in general, surgical treatment is too hastily resorted to in this affection, and he wishes to bring under the notice of the profession a remedy he has found of great efficacy during twenty five years. It consists in the administration of two ounces of fresh linseed oil every morning and evening; and so rapid is the amendment generally, that the remedy is seldom continued longer than a week. Sometimes the stools are somewhat increased in quantity, but neither vomiting nor any other ill effect is produced. The only precaution the while, is the abstinence from alcoholic drinks and too stimulating a diet.—*Ibid*, from *L'Union Médicale*.

Method of hardening Objects in Plaster of Paris, and rendering them like Marble.—Take 2 parts of stearine, 2 parts Venitian soap, 1 part pearlash, and 24 to 30 parts of solution of caustic potash. The stearine and the soap are cut into slices, mixed with the cold ley, and boiled for about half an hour, constantly stirring. Whenever the mass rises, a little cold ley is added. The pearlash, previously moistened with a little rain-water, is then added, and the whole boiled for a few minutes. The mass is then stirred until cold, when it is mixed with so much cold ley that it becomes perfectly liquid, and runs off the spoon without coagulating and contracting. Before using this composition, it should be kept several days well covered. It may be preserved for years. Before applying it to the objects, they should be well dusted, the stains scraped away, and then coated by means of a thick brush with the mass as long as the plaster of Paris absorbs it, and left to dry. The coating is then dusted with leather or a soft brush. If the surface has not become shining, the operation must be repeated.—*Archiv der Pharm.*, lvi. p. 327.

Process of Engraving upon Ivory.—The process used to cover ivory with ornaments and designs in black consists in engraving in the ivory itself, and then filling in the designs with a black hard varnish.

To obtain finer and more regular designs, the ivory is to be covered with the common ground, and by means of the point the designs are engraved upon it. They are then eaten in by a solution formed as follows:—

Fine silver	-	-	-	6 grms.
Nitric acid	-	-	-	30 "
Distilled water	-	-	-	125 "

At the end of about a half-hour according to the depth to be given, it is to be washed with distilled water and dried with bibulous paper. The design is then exposed for an hour to the solar light, and the layer of wax is removed by essence of turpentine.

The design has then a black color or a dark brown, which blackens entirely at the end of one or two days. Other colors may be produced, by replacing the solution of nitrate or silver by a solution of gold or platina in *aqua regia*, or of copper in nitric acid.—*Chem. Gaz. July 1, from Revue Scientifique*, xxxv. p. 433.

Show Colors for Druggists' Shop Windows.

BLUE.

No. 1.—Sulphate of copper $\bar{3}j$, sulphuric acid $\bar{3}ss$, water $\bar{3}x$.

No. 2.—Ammonio-sulphate of copper, ammonio-nitrate of nickel (see No. 5) and water.

No. 3.—Prussian blue gr. x., oxalic acid gr. xx., water $\bar{3}xvj$.

No. 4.—Dissolve nickel in diluted sulphuric acid, add ammonia in excess, and dilute with water.

No. 5.—Dissolve nickel in diluted nitric acid, add ammonia in excess and dilute with water.

GREEN.

No. 1.—Sulphate of copper $\bar{3}ij$, chloride of sodium $\bar{3}iv$, water $\bar{3}xx$.

No. 2.—Dissolve $\bar{3}j$ of nickel in $\bar{3}vj$ of nitric acid, and add $\bar{O}v$ of water.

No. 3.—Dissolve nickel in dilute sulphuric acid, and dilute with water.

No. 4.—Dissolve sulphate of copper in water and add bichromate of potash until the required color is produced.

No. 5.—Dissolve ammonio-sulphate of copper in water, and add bichromate of potash until the required color is produced.

No. 6.—Dissolve sulphate of copper in water, and add nitric acid until the required color is produced.

No. 7.—Dissolve distilled verdigris with acetic acid, and dilute with water.

LILAC.

No. 1.—Dissolve zaffre (impure oxide of cobalt) in hydrochloric acid, filter, and add carbonate of ammonia in excess; to this add ammonio-sulphate of copper until the required color is produced.

No. 2.—Dissolve zaffre in hydrochloric acid, filter, and add carbonate of ammonia in excess; to this add ammonio-nitrate of nickel (see *Blue*, No. 5) until the required tint is produced.

ORANGE.

No. 1.—Dissolve bichromate of potash in water until the required tint is produced.

No. 2.—The same as the last, but adding some oil of vitriol or hydrochloric acid.

PINK.

No. 1.—Dissolve \mathfrak{z} ij of zaffre in \mathfrak{z} vj of hydrochloric acid, filter, add solution of carbonate of ammonia in excess; then add $\mathfrak{f}\mathfrak{z}$ j of liquor potassæ, and dilute with water, to produce the required color.

No. 2.—Nitrate of cobalt may be used, with carbonate of ammonia, in the same way as the last.

PURPLE.

No. 1.—Sulphate of copper \mathfrak{z} j, carbonate of ammonia \mathfrak{z} jss, water Oijss.

No. 2.—The last color, with a small quantity of the *Pink* No. 1.

RED.

No. 1.—Macerate powdered cochineal in spirit of hartshorn, and dilute it with water.

No. 2.—Dissolve carmine in solution of ammonia, and dilute it with water.

No. 3.—Wash the best madder two or three times with cold water, then macerate it in solution of carbonate of ammonia, filter the solution, and dilute it with water.

No. 4.—Dissolve madder lake in solution of carbonate of ammonia.

VIOLET.

Ammonio-sulphate of copper, diluted with water, and enough of the pink color No. 1 to produce the required tint.

YELLOW.

Bichromate of potash \mathfrak{z} vj, carbonate of potash \mathfrak{z} iv, water \mathfrak{z} xvj.

Pharmaceutical Journal August 1, 1850.

Syrupus Iodidi Ferri. By Mr. TIZIER, Apothecary.—As the King and Queen's College of Physicians in Ireland have introduced this valuable therapeutic agent into their newly established formulary, I would be glad to record a few practical points of interest attached to its preparation, for the purpose of simplifying and completing the process, especially as they appear to have been overlooked in the details of every prescribed formula since its first introduction into notice by Dupasquier.

The new Dublin pharmacopœia directs "to introduce the Iodine, iron and water, into a glass flask, and apply a moderate heat until the solution loses its red color." Now, as the great success of the first part of the process depends on the rapidity with which it is conducted, without any unnecessary exposure to the air (but what cannot be avoided) until a neutral solution be affected, there is evidently considerable time lost, and danger of decomposition in-

curred by pursuing these directions. This circumstance appears more remarkable, when we are aware that all extraneous application of heat is superfluous. Iodine and iron exert so powerful an affinity for each other in the presence of water, as to combine with the greatest facility, generating a large amount of sensible heat; at the same time it is only necessary then to bring their particles *constantly in immediate contact with each other*, to fulfil this end to our entire satisfaction, and for this purpose, two practical points must be attended to, first, to *rotate* the flask containing the mixed substances briskly and diligently for some moments in the hand, until the deep red color of the solution disappears, and is succeeded by its olive-green pellucid and normal one, which, when tested, should be perfectly permanent to the action of amidine. And, secondly, to break down the iron turnings as small as possible, carefully freed from any adhering oxide, by which means a greater superficial extent is exposed to chemical action, and thus ensure rapidity of combination more easily.

By careful attention to these apparently insignificant points, the preparation, in its first stage, will be divested of much of its practical difficulty, and rendered easier of execution, while risk from decomposition will be entirely obviated. Care should be taken to filter the solution (after testing it) into the saccharine mass, which preserves the neutral iodide of iron so far as to preclude the possibility of change from any subsequent heat that may be employed.—*Pharmaceutical Journal*, November 1, 1850.

Red Color for Paper Hangings, &c.—It is proposed to employ the red chloride of chromium for the production of an intense red-violet color, possessing metallic lustre, proper for printing or staining paper.

This product is prepared, as is well known, by passing a current of dry chlorine gas over a mixture of powdered charcoal and calcined oxide of chromium, inclosed in a glass tube. Attention must be especially given in this operation to the fact that, by reason of the difficulty of volatilization of the product, the chloride prepared by a first operation remains mixed with the powdered charcoal. It is therefore requisite to submit this mixture of charcoal and chloride of chromium to a second operation, taking care to cover the bottom only of the glass tube with it, in which case the product will be sublimed in the upper part of the tube. The heat of an Argand lamp, the flame of which is brought gradually upon the tube, will suffice for the formation of the chloride, which soon appears in the form of brilliant micaceous peach-colored spangles. The chloride is then ground in a mortar, and thickened with a mucilage of gum. On being laid upon paper, it will display its original color, and will resist the action, not only of acids and alkalis, but also the direct action of the solar rays.—*Ibid*, June 1, 1850, from *Newton's Journal*, April, 1850.

Editorial Department.

OUR JOURNAL.—In presenting the present number to our readers we take occasion to remind them of our promise in the last one, to enlarge the future issue. It will be seen that the page has been increased in dimensions without rendering it necessary to alter the size of the binding. The Varieties have been set in smaller type, and the whole typography made more compact.

Several original articles intended for this number were not received in time for insertion, but will appear in our next.

We have received several specimens of the wood, bark, leaves, and fruit of the "Sassy bark" tree of Western Africa, from Dr. McGill of Cape Palmas through the kindness of Moses Sheppard, Esq., of Baltimore; and hope to be able to present the results of the examination, to which we are now submitting the bark, to our readers in the next issue.

We will be glad to receive from any of our Cincinnati friends an account of the progress of their College of Pharmacy; and also information respecting the cultivation of Peppermint and the distillation of its volatile oil, as conducted in Ohio.

We will feel indebted to any of our readers in St. Louis, for information relative to the castor oil culture manufacture and trade as conducted in Illinois and other parts of that section of country.

COLLEGE OF PHARMACY AT BOSTON.—We learn through the *Medical and Surgical Journal* of Boston, that the Apothecaries of that city have taken steps preliminary to the institution of a College of Pharmacy. It appears that the recent prosecution of Mr. Wakefield for an error in compounding a prescription, has awakened both professions to the necessity of giving a more thorough education to the persons in whose hands the practice of pharmacy is, and will in future be placed. There are none of us but can learn something new daily, if an ordinary share of observation is extended to what is going on around us in the shop. The apothecary or chemist has an extensive field for the range of his perceptive faculties, and when these are on the alert errors should be "few and far between." It is the want of a proper training of these faculties with a view to his daily duties, based on the knowledge acquired by the study of good books, illustrated by his preceptor or the lecturer, that gives rise to the numerous illy qualified apothecaries, even in our large cities. If a boy is placed with a master carpenter with a view to his becoming a proficient, he is expected meanwhile to be taught mensuration, draughting, and other theoretical and practical studies, unless he has previously learned them, and without which he would continue always a journeyman—a mere automaton. It is the union of the rules of

mensuration and skilful draughting, brought to bear on the mere mechanical parts of his business, together with a sufficient knowledge of the materials with which he works, that distinguishes the true master carpenter—the builder—the architect—he who unites gracefulness of outline and utility of object in the construction of our private and public edifices. So it is with the pharmaceutist; it is not merely in the use of the pestle and mortar, the balance and weights, the spatula and measure glass that he is to be skilful; these and the other practical details are as necessary to him as the use of the jack-plane, the chissel, and the square, are to the carpenter; but he should be familiar with the laws and materials of chemistry that he may mix correctly and avoid incompatibilities; he should be well read in the sciences accessory to pharmacy, that he may *know* that he is not selling Belladonna for Hyoscyamus, or potatoe starch for the fecula of the Maranta, and not risk his reputation on the probable accuracy of those who sell him drugs; and lastly he should be versed in therapeutics to detect the errors of physicians when they happen to prescribe wrong articles or inordinate doses.

A special education, then, adapted to his profession, all will admit, is as necessary to the pharmaceutist as to the builder—it is a sense of this fact that has aroused our Boston brethren to the laudable course they have commenced and in the accomplishment of which we heartily wish them success.

The following is a notice of the proceedings of a meeting of the apothecaries of Boston and its vicinity, called at the suggestion of Dr. George Stevens Jones, acting Editor of the *Medical and Surgical Journal*.

“In accordance with a previous notice, a large number of the apothecaries of Boston and vicinity met at the house of Dr. George Stevens Jones, on Friday evening, Nov. 29th, 1850. The meeting was organized by the choice of Wm. B. Little, chairman, and S. R. Philbrick, Secretary.

Dr. Jones being called upon, stated the object of the meeting, viz., to consider the establishment of a Pharmaceutical College in Boston. He mentioned in detail the importance of such an institution, and the advantages to be derived from it; he considered it entirely practicable—that it would not be dependent upon Boston or Massachusetts for its support, but upon New England. Remarks were then made by Mr. Wm. Brown, Mr. Thayer of Cambridge, Mr. Spaulding, Mr. White, followed by many others, all of whom gave their full concurrence in the utility of such an institution. Mr. H. D. Fowle addressed the meeting upon the necessity of united action in the matter—he believed that protection to the community, to the physician and to the legitimate apothecary, all demanded that pharmaceutical education should be raised to some fixed and higher standard.

It was then voted that a committee of five be appointed to confer with the apothecaries generally in Boston and vicinity, upon the subject before the meeting.

Voted, that Messrs. H. D. Fowle, A. Boyden, H. Thayer, A. Brown, and S. R. Philbrick, constitute that committee.

Voted, that this committee be authorized to procure at the expense of the meeting, a Hall or other place for the next meeting.

Much enthusiasm prevailed during the meeting; and but one opinion seemed to exist. All concurred in the belief that such an institution is necessary, and that it will be established—that while New England leads in

almost everything besides, she shall not always be second in furnishing means for properly educating so responsible a class of men as her apothecaries.

It was then unanimously resolved that the thanks of this meeting be presented to Dr. Jones for his able and well-directed efforts in this matter, and also for so generously throwing open his house for this meeting.

At a late hour the meeting was adjourned to Friday, Dec. 13, 1850, at 3 o'clock, P. M.

S. R. PHILBRICK, *Secretary.*"

SHAKER'S EXTRACTS.—A member of "the United Society (of Shakers) at New Lebanon, N. Y., has sent to us some samples of medicinal extracts prepared at their establishment, desiring our opinion of their merits. Although we have no disposition to covet *presents* of this kind for any value they may have intrinsically; nor yet because we are desirous of assuming the troublesome, and often difficult task of deciding on the relative or positive merits of pharmaceutical preparations; we nevertheless are not unwilling to give a portion of time and labor to their consideration when our examination may prove servicable to our readers, or may tend to improve the quality of articles largely consumed. It is of no import to us in whose hands the preparation of extracts may fall, provided they are well made from the best materials. The Society of Shakers have long been engaged in the preparation of medicinal extracts, in connection with their other business of collecting medicinal plants, and the amount of their extracts consumed annually, is if we are rightly informed, very considerable; hence any improvement that can be affected in their processes will be a general benefit, to the extent of the consumption. In a recent number we noticed several of the products of the Messrs. Tilden & Co., and referred to their having introduced the vacuum apparatus, on a large scale, in the manufacture of extracts. Following the example of these gentlemen, the Society of Shakers have provided their laboratory with a vacuum evaporator, and the extracts now submitted to our notice are a portion of its first fruits.

The *extract of conium* has a brownish green color, its consistence is hardly firm enough. Mixed with a strong solution of potassa the odor of ammonia and conia are at once developed, and the latter in sufficient force to indicate a fair extract. It would have been improved had the juice been developed and the latter in sufficient force to indicate a fair extract. It would have been improved had the juice been deprived of chlorophylle before evaporation. Recent observations (see page 73) show conclusively that the salts of conia are decomposed gradually during evaporation; hence too much care cannot be observed in conducting the inspissation of the juice. Nor should the plant be gathered before or after the season most favorable to the developement of the activity of the leaves. This is considered to be when the flowers are fairly developed on the terminal umbels. Mr. Brande considers the extract of the leaves superior to that of the whole plant. The most critical point in the evaporation of hemlock juice, according to Dr. Christison, is when it attains a syrupy consistence at which period with a heat of 212° Fah., ammonia is given off together with a modified odor of conia; and in proportion as the ammonia is

evolved the extract is deteriorated. If the manipulators of the "United Society" will attend to these hints, as to season of collection, and will remove the albumen and chlorophylle from the juice before evaporation in their vacuum apparatus, they will be able to produce an extract decidedly superior to the one now examined, although this is greatly superior to much that is in the market.

The *Extract of Stramonium*, except in containing the chlorophylle and albumen, and in being rather too soft, is an excellent preparation. We are aware that many apothecaries prefer these extracts of juices to be green, and look upon the greenness of the color as an index of the careful preparation of the extract; but it is contrary to the pharmacopœia to retain those substances, and well conducted experiments by M. Solon, has proved the green coagulum formed in the juices by heat to be nearly inert, hence their presence only tends to enfeeble the proper extract.

The *inspissated juice* of Belladonna has a more herbaceous and less narcotic odor than the English, and contains the chlorophylle, but in other respects it appears carefully made. We are unprepared to speak of its therapeutic value as compared with the English extract.

The *Extract* of Belladonna, is a different article from the evaporated juice. We are not informed whether it is made from the dried plant with water, or from the recent plant with the assistance of the same solvent. Its odor is different and less powerful than the preceding, and evidently is not the official preparation.

The four remaining samples were *Extracts of Dandelion*. The first of these has a brown waxy colour, good consistence and the peculiar sub-bitter taste of the root. It was prepared by mixing the ground fresh roots with a portion of alcohol, expressing out the spirituous juice, and evaporating in vacuo, at 120. It is one of the best samples of Extract of Dandelion we have seen.

The *second* extract was prepared wholly from the fresh herbaceous tops, has a green colour, and sharp bitter taste. We do not know how it compares in medicinal qualities with the extract of the root, for which, however, it should not be substituted without an understanding with the prescribers.

The *third* extract was made by macerating the ground fresh roots in hot water, evaporating to a syrup in vacuo, and finishing in the open air. It was a fair preparation, but not so good as the first.

The last specimen was brown and transparent like treacle, and so sweet that the presence of sugar might be suspected. As it was said to be carefully made, the roots must have undergone some change to have yielded such a product. It had the appearance and taste of an extract made by long boiling except that the colour was too light.

It is one of the principal features of a well qualified manufacturing pharmacist to be acquainted with the chemical constitution of the substances he manipulates with, to know which of their constituents are valuable and to be desired in the products, and the relations of solvents, and physical agents to those constituents. For this reason, in most cases, we think a regularly educated pharmaceutical chemist the fittest person to be engaged in this

branch of industry. Yet in reference to that section of the extracts, which are made from recent plants, the position of botanical gardeners is so favorable as to give them great advantages, assuming them possessed of the requisite knowledge, skill, and apparatus. We have confidence in the business integrity of the "United Society" as far as their experience goes; but we believe they need more chemical knowledge, especially more of that which relates to the proximate principles of plants.

Dictionnaire des Alterations et Falsifications des substances Alimentaires, Medicaments et commerciales, avec l'indication des moyens de les reconnaître. Par. M. A. CHEVALLIER, Pharmacien, Chemist, Professor, &c. Tome premier. Paris, 1850. pp. 470.

The above is the title page of the first part of a work on sophistications, etc., by M. Chevallier of the School of Pharmacy at Paris. This volume extends from A. to K., inclusive, and professes to point out the deteriorations and adulterations of substances, used in medicines, for food, and in the arts; with the means of detecting them. We have not given the volume before us a very thorough examination; but after having carefully read over a number of the articles and glanced at numerous others, we cannot withhold the expression of satisfaction. Like all books which treat on this subject, however, there is much in it that is of little value to the investigator. In fact, there are many substances, the subjects of adulteration, that seem entirely beyond the skill of the chemist, whose best efforts will hardly be able to ascertain their presence, much less specify their character. Many of the adulterated essences and extracts, come under this head. In reference to substances which are capable of proximate analysis, very full and distinct means are suggested for the detection, and sometimes for the isolation of the sophistications. We will notice it more critically when the remaining portion has made its appearance.

Chemical Experiments, Illustrating the theory, practice, and application of the science of Chemistry, and containing the properties, uses, manufacture, purification, and analysis of all inorganic substances, with numerous engravings of apparatus, &c. By G. FRANCIS F. L. S., etc., etc. *A new and improved edition.* Philadelphia, Daniels & Smith, 1850. pp. 250 octavo.

The above volume, under the modest title of Chemical Experiments, presents an unusual amount of interesting and instructive information. It is a combination of the abstractly scientific, the useful, and the amusing. Without any claims to a regular treatise on Chemistry, and therefore not intended as a text-book to the regular student, it nevertheless will be found useful by him, owing to the great variety of experimental illustrations it offers. But to the amateur chemist, to the man of general knowledge desirous of information on chemical subjects, and especially to the apothecaries' apprentice, and to the apothecary himself, the book will prove a valuable store-house of facts. The apparatus and manipulations are extensively illustrated by wood cuts.

Review of Chemistry for Students. Adapted to the classes taught in the principal Medical Schools of the United States. By JOHN G. MURPHY, M. D. Philadelphia, Lindsey & Blakiston, 1851. pp. 328, 12 mo.

This little volume has been written to facilitate the labors of the medical student. Chemistry is one of his stumbling blocks and as a general rule is less thoroughly acquired than the branches more specially medical. The design of Dr. Murphy is to aid the teacher collaterally and the student directly. The slight examination that we have been able to give it, has impressed us favorably as to its usefulness for the purpose intended. It is well printed on good paper, and got up in a style creditable to the publishers.

LABELS FOR PHARMACEUTICAL SPECIMENS.—The Label Committee of the Philadelphia College of Pharmacy have prepared and will shortly publish a set of labels for specimens of nearly all the preparations of our pharmacopœia, and of many that are not officinal. These labels correspond with the set for *Materia Medica* specimens published last year. Lecturers on *Materia Medica* and Pharmacy, Physicians who have private classes of students, and students themselves who are collecting cabinets for their own purposes, will find these labels a useful and ornamental addition to their collections; giving uniformity to their appearance. As the Latin and English names, and the strength of the preparation, in many instances, are indicated, much information is conveyed by them.

THE
AMERICAN JOURNAL OF PHARMACY.

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APRIL, 1851.  
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REMARKS ON COD LIVER OIL.

BY WILLIAM PROCTER, JR.

The extensive use now made of cod liver oil as a curative agent, both by the medical profession and by the people, renders information bearing on the subject sufficiently interesting to attract attention. Heretofore but little has appeared in the journals, throwing light on the cod liver oil manufacture and trade of our north-eastern coast, and it is almost a matter of surprise that so little knowledge of the subject should be in the possession of the numerous persons whose business it is to dispense daily this, at present, popular medicine.

The essay of De Jongh in 1843, has made us acquainted with the fish liver oils used in Germany under the name of cod liver oil, and also with their complex chemical constitution, by several most difficult analyses. The general facts relating to the subject as ascertained by De Jongh will be found in a paper by Dr. Pereira, reprinted in vol. xxi, page 136 of this Journal.

The three varieties of cod liver oil known in the commerce of this country are parallel with those described by De Jongh, viz : pale yellow, pale brown, and dark brown. The collectors of the oil, in the Baltic and German seas, do not appear to confine themselves to the *Gadus morrhua* or true codfish, but the *Gadus carbonarius*, (coal fish) *Gadus callarius*, (or dorse) and *Gadus pollachius*, (or pollack) all contribute to the product as furnished by the fishermen of the Norwegian coast.

The same is true of the cod liver oil production of the New England Coast :—the *hake*, the *haddock*, and the *pollack*, (*Gadus pollachius*) all contribute more or less to the commercial oil, especially to the light colored variety, and are sometimes wholly substituted for it. This is partially the result of the habits of the fish. The codfish, associated in shoals more or less numerous, move about from one feeding ground to another along the coast, as humor or the abundance of their food may incite them. They are sometimes preceded by, and sometimes followed by shoals of the hake, haddock, or pollack, these fish seeking similar food, (marine worms) and frequenting the same submarine formations. The fishermen may therefore commence their labors in the morning among the true cod, and before evening sets in find themselves pulling in some one, or all the varieties mentioned, as the case may be. Now these fish appear to be all sold under the general title of codfish, but dealers in the article know the difference, and commercially the true codfish commands a better price. Less care is extended to the livers, which, unless especially cared for, are thrown indiscriminately into the receptacles as they are taken from the fish.

De Jongh, whilst admitting the mixed character of the cod liver oil used in Germany, offers no opinion as to the relative therapeutical merits of the pure liver oils of the dorse, coal fish, and pollack; nor has he shown that these oils differ in chemical constitution from the true cod oil, his three analyses relating only to the commercial varieties founded on color.

To the kindness of Mr. O. S. Hubbell of this city, who has visited the district where the oil is made, and himself engaged in its preparation, I am indebted for much of the information contained in this paper, and for specimens of the pure liver oils of each of the four varieties of fish mentioned; the results of some few experiments with them will be given in another part of this paper.

Not forgetting that these oils contribute more or less to much of the commercial cod liver oil, although not acknowledged, we will examine a little closer into the origin and commercial history of the latter.

The terms *bank* oil, *straits* oil, and *shore* oil, are familiar to the large dealers in cod liver oil.

The *bank* oil, so called from its manufacture from fish caught on

the great fishing ground of the Banks of Newfoundland, is the best when in good condition, because in that locality the fish attain a size and perfection not equalled in any other waters.

Our readers are generally aware that these Banks, as they are called, consist of thousands of square miles of shoal water with sandy bottom off the north-eastern coast of North America, and so named from their contiguity to the Island of Newfoundland. They constitute the largest sub-marine elevation in the world, and abound in species of worms which are the great attraction to the codfish. (Murray's Encyc. Geograph.) The great north-eastern current of the Atlantic, after sweeping around the coral-bound coasts of Florida, and gliding past the insular impediments of the Bahamas, laden with spoils of the living and the dead from the tropical seas, proceeds on uninterruptedly until it strikes on this great sub-marine plain (which perhaps it has contributed to elevate,) and there, deprived partly of the momentum which has upheld its suspended contents they are deposited, to be an inexhaustible and ever replenishing store for the benefit of the innumerable finny hordes that animate the waters above. No wonder, therefore that the codfish frequent them in such countless numbers, that it is necessary to assist the imagination by recollecting that ten millions of eggs have been counted in a single female codfish of moderate size, to appreciate their abundance. In this favored locality they frequently attain a size of forty to seventy pounds, and their livers are not only larger and healthier, but afford a greater per centage of oil weight for weight. The best Bank livers frequently contain one-half and sometimes two-thirds of their weight of oil.

The British fishermen who have all their arrangements for oil making on the shores of Newfoundland have the greatest advantages, for they not only have the best fish, in common with the fishermen of other nations who frequent the banks, but they have the *exclusive right to fish within three miles of the coast*. Their boats run out from platforms erected along the shore, at the fishing settlements, and as soon as they catch a load, return and deliver them to persons on the platforms, who attend at once to cleansing and salting the fish, and to the preparation of that portion of the oil obtained from fresh livers, the greater part, however, being left for conversion into brown oil, as will be noticed presently. It may

be true also that the finest fish approach the shore where the marine annelidæ are more likely to abound than in the deeper sea beyond the imaginary line drawn along these coasts by the treaties of English statesmen.

The American fishermen not having the same facilities, possessing by treaty only the right to dry their fish on the unoccupied portions of the coast, and having necessarily much larger vessels engaged in the service, visit the drying stations at longer intervals, and from its comparatively small importance care little about the production of the white or pale yellow oil. In these fishing vessels, casks are suitably placed on deck, and as the fish are cleaned at sea, the offal is thrown overboard, whilst the livers are cast into the receptacles, where they accumulate for days and weeks, the tissues undergoing a gradual disintegration as the putrefactive process progresses, permitting the oil to escape, which, from its inferior density, gradually rises to the surface. The first oil that separates on the surface, before the process of putrefaction has fairly set in, is almost as sweet and pure as the shore oil, and constitutes the medium quality or *straits* oil, corresponding with the pale brown oil of De Jongh. It commands a much better price than the brown oil. Its color is due partially to the oxidation of the gaduin by exposure to the air, and partly to contact with the bile constituents and decomposing tissues.

The *brown* oil is made from the residues after the *straits* oil has been skimmed off from the casks, or it may include the latter if the fishermen postpone its removal until it has too far deteriorated by exposure. The brown oil is made just when it suits the convenience of the fishermen, and as they cannot do it aboard their vessels, the periods are longer or shorter according to their luck in fishing. The contents of the liver casks are removed to boilers, heated with some water, and thrown on strainers, that the oil and watery part may drain through. The oil is separated, heated to free it from water, and put into barrels for commerce.

Shore oil, correctly speaking, is the kind made on the coast from fresh livers, before they have had time to change, and applies as much to the bank oil so made, as to that produced along

the New England shore of the Atlantic, to which latter product, however, the name is usually applied.

Before describing the several methods adopted in the extraction of the shore oil, it will be well to explain the condition in which the oil exists in the livers. Healthy cod livers are plump, have a uniform, pale fawn color, and are exceedingly tender. When unhealthy, they are less plump, smaller and more or less discolored. The latter are generally derived from fish that frequent unfavorable localities, or where their natural enemies interfere with their quiet feeding. The oil exists in the tissues of the livers as an albuminous emulsion consisting of an aqueous fluid intimately intermixed with the oil. When this is pressed out and allowed to stand, the oil gradually separates and rises to the surface, whilst an opalescent fluid collects beneath. The recent oil, when not injured in the process of preparation, has a fresh-fishy odor, which it gradually loses, and afterwards, by age and exposure, acquires the odor and taste of lamp oil.

The ordinary process of making shore oil is to throw eight or ten buckets full of cod livers into a suitable boiler, add three or four gallons of water and heat them till the tissues are broken up and the whole becomes a kind of magma. A large cask or tub is then arranged with a straining cloth across its open head, and the contents of the boiler poured upon it. The oily and watery portions pass through, leaving the membranous parts on the strainer. By standing, the oil separates, is drawn off, and after another straining is barrelled for the market.

The oil of cod livers is made in this way, in quantities varying from a few gallons, in the fisherman's cottage, to hundreds of barrels in the various fishing establishments, which in one form or another, are located along the coast from Cape Cod to Nova Scotia, but most largely perhaps, in the neighborhood of Gloucester, Massachusetts. The New England oil has less color than the bank (shore) oil, but it is less rich in the peculiar principles of the oil, a fact attributable perhaps to the less perfect development of the fish of our own fishing grounds; a supposition corroborated by the fact that the yield of oil by the livers varies from 10 to 30 or 40 per cent. on the latter stations, whilst on the Banks from 30 to 60 per cent. is the more usual product.

Since the extensive employment of cod liver oil in medicine,

more care has been extended in preparing it for medicinal use, and perhaps the most improved innovation on the old method described, is to expose the livers contained in a suitable tin reservoir, heated with steam applied externally by a jacket, until they assume the condition of a magma, when this is thrown on a strainer, and the mixed oil and water that passes separated and purified, as has been before described, with the precaution to act on the livers as soon after their removal from the fish as possible, and to perform the process with such expedition that the oil is not injured by undue exposure to the air.

The fishermen along shore sell their oil to the store keepers in trade, who in turn, as it accumulates, send it to the large dealers in the seaport towns. At some of these establishments in Boston there are reservoirs, capable of holding many hundreds of gallons, constructed of stone and cement, in their cellars, in which the brown oil is kept separately. As this oil is brought in from the smaller dealers or fishermen, it is emptied into these, where it clarifies by subsidence and is pumped up into barrels for commerce. The exposure which it undergoes tends to increase its strong lamp-oil odor, and as a large proportion of the brown oil employed in the United States passes through the hands of these dealers, it follows that the medical public do not receive even this oil in its least repulsive form. The white oil, on the contrary, is kept in the barrels into which it is originally introduced, and these, if originally tight and pure, form very good receptacles. Some of the druggists of Boston, New York and Philadelphia, have made special arrangements with persons engaged in the codfishery, and who make the oil by the improved method, with a view to its use in medicine; and where these persons prove true to their engagements, there is no reason why the blandest and purest oil should not be obtained.

A specimen of pure cod liver oil in my possession, is entirely free from the lamp-oil odor, but has the fresh-fishy smell indicative of its recent and careful preparation. Its sp. grav. is .917. at 72° Fahr. Mixed with ordinary sulphuric acid, it is instantly changed to a dark red brown transparent color, like tincture of kino. Mixed with nitric acid, sp. grav. 1.36 and shaken, it is colored instantly of a pinkish cast, which soon becomes brown,

and by standing on the acid it gets darker, and finally is slowly decomposed, frothing over with evolution of nitrous gas.

Nitric acid of sp. grav. 1.215, (formed by mixing 3 parts of ordinary white nitric acid with 2 parts of water), when shaken with it, at first produces no change, but gradually the oil assumes a dull green hue, retaining its transparency. After standing four days on the acid, the green color slowly changes to brown. Mixed with an acid solution of nitrate of mercury (as used for citrine ointment), the oil thickens, becomes yellow, and finally orange-yellow, with evolution of nitrous gas and much frothing.

The specimen of *haddock* liver oil has less color than the cod oil, has a slight lamp oil odor and taste, and its specific gravity is .9195. It reacts with sulphuric acid, acid nitrate of mercury, and nitric acid sp. gr. 1.36, almost precisely like the cod oil. Nitric acid sp. gr. 1.215 after contact for four days colors it a clear brown without a shade of green.

The specimen of *hake* liver oil resembles the haddock oil in color, odor and taste. Its specific gravity is .915. It reacts with sulphuric acid, nitric sp. gr. 1.36, and the acid nitrate of mercury in the same way, but with nitric acid sp. grav. 1.215; by standing 24 hours it gradually assumes a greenish brown color, which it loses as the action of the acid continues, and becomes of a light brown hue, much lighter than that of the haddock oil.

The specimen of *pollack* liver oil very closely resembles the hake oil in color, odor, and taste, and in all the reactions with sulphuric and nitric acid. Its specific gravity is .9155.

Sperm (lamp) oil, when treated with nitric acid sp. gravity 1.36, is colored pinkish brown gradually, but when agitated with the acid sp. grav. 1.215, it assumes only a pale brown color without a shade of green, hence the presence of this oil or of haddock oil should render the green color occasioned by this acid on true cod oil to be less deep.

These reactions are not offered as affording reliable means of distinguishing true cod-liver oil, either from the liver oil of allied species of fish, or from whale oil. To arrive at any such desirable criteria we must be better acquainted with the organic constituents of all the oils, and their relations to reagents. Yet they may serve to show how little dependence can be placed in the action of the so called tests for cod-liver oil, sulphuric and nitric acid.

Modes of administering cod liver oil. The general disgust excited by the taste and odor which the commercial cod-liver oil often presents, has arisen from the fact that the largest part of that now used has either been carelessly made or badly preserved, or because many physicians still cling to the idea that the rancid brown oil possesses more medical power than the light yellow or proper medicinal oil. Under the impression that the *lamp oil odor* is a true characteristic of all cod-liver oil, though less apparent in the light-colored kind, some physicians in prescribing it for children or adults, whose fastidiousness rejects it unless disguised more or less effectually, have had the oil incorporated with mucilage in the form of an emulsion. One objection to this medicine is, that cod-liver oil, to produce its full effects, should not only be long continued in use, but should be given in increased doses, so that in the form of an emulsion, except for children, the quantities would be excessively bulky. By far the best way to take it, whether *pure* or *rancid*, is the following: When porter (or beer) is not contra-indicated, put two or three table-spoonfuls of it in a small tumbler, pour on to this the oil, to be taken without stirring or otherwise mixing them, and then agitate the bottle of porter, and cover the oil with the foamy beverage. By this means the patient does not see the oil, the first impression in the throat is from the porter, and the oil passes down untasted, whilst the substratum of the beverage effectually removes any lingering taste of the medicine. It is well to take a sip of the porter before taking the dose.

The syrup of sarsaparilla answers equally well, and is devoid of the stimulant quality of the porter. When the oil is in its purest state, but little difficulty is presented in swallowing it, and it may be taken floating on peppermint or other aromatic water, observing to swallow a mouthful of the unmixed water before hand.

A far more serious objection, according to Mr. Hubbell, to taking rancid cod-liver oil in the form of an emulsine, is that when so taken it remains longer in the stomach, becomes mixed with its contents, and gives rise to eructations more disagreeable to the patient than the act of swallowing the medicine. On the other hand, when taken merely floating on a vehicle in the manner mentioned, the oil soon passes into the duodenum, and its exhibition is attended with less of the disagreeable accompaniment mention-

ed, especially if the oil is taken two or three hours after meals, instead of just before or after them.

Still another objection to the emulsive preparations of this medicine is the following. Cod-liver oil has a strong tendency to absorb oxygen, to become rancid, and to acquire the odor and taste of lamp-oil. By admixture with water in an emulsion, this tendency is greatly increased, so much so, that by the time a bottle is consumed the last portions are sometimes exceedingly disagreeable.

When the oil is in its purest and freshest condition, comparatively little objection is made to it by the large majority of patients, and it should be the aim of Pharmacutists not only to encourage the production of carefully made oil, but they should give much more attention to its *preservation*, than has heretofore been extended.

Preservation of Medicinal Cod Liver Oil.—As soon as manufactured, the oil is introduced into barrels, which are securely bunged and nearly full. If these barrels are tight, and pure at first, there is no difficulty in keeping the oil in good condition for a year at least, as Mr. Hubbell has ascertained by trial. But what are the facts:—A druggist buys a barrel of the oil in many instances, and commences its sale by the removal of a few gallons, thus admitting the air to a larger surface with each removal of the oil, which is thereby becoming more and more deteriorated, especially if slow demand lengthens the period required in the disposition of the barrel. The same remark applies to the retail druggist and apothecary. He buys say a gallon or two of the oil, keeps it in the same vessel, until he has retailed it out in small quantities.

Now the true course to pursue, is for the druggist when he opens a barrel to fill it into tin cannisters to suit the wants of his customers, the apothecaries, and seal these securely. The apothecary should at once on buying a cannister, bottle the oil in quantities to suit the demands of his neighborhood, and he had better assume the extra trouble of opening a bottle, when purchasers bring vessels of their own for the oil, than not pursue this course.

With these precautions in the wholesale and retail dealer, cod liver oil may be preserved in its best condition for a long time, and if it really merits the high encomiums which have been passed

on it, the additional trouble which these precautions require, should not be withheld. There are persons who, in using the cod liver oil, feel disappointed that a single bottle or two has not wrought the changes they so earnestly desire, and give up its use. Such persons should be advised not to waste their money; for unless (even in cases where the alterative and nutritive effects of the oil are strongly indicated,) its use is persevered in for a considerable length of time, and in doses by no means homœopathic, it will be in vain to expect the excellent results which have been derived from its curative power in the hospitals as well as in private practice; results greatly more attainable if the patient is not subjected to the constantly recurring disgust and nausea, from ill made and badly kept oil.

ON THE MEANS FOR DETERMINING THE PURITY OF CERTAIN CHEMICALS AND DRUGS, AND FOR DETECTING ADULTERATIONS.

(Continued from page 3.)

[A large part of the article on Iodine has been taken from observations by Dr. Herzog, of Germany, published in the *Pharmaceutical Journal*, Dec. 1850, and *Central Blatt*.—EDITOR.]

IODINE as met with in commerce, is presented in two forms, viz: in well defined dry crystals, having a metallic lustre and blueish black color, as "resublimed" iodine; and as a dark iron grey substance having the appearance of unoxidized iron filings, more or less moist, cohering together in lumps and adhering to the sides of the bottle, called "commercial iodine," or simply iodine.*

The impurities which have been found in iodine, either accidental or designed, are quite numerous, but the British product, which is that most largely used in this country, does not appear to be so frequently the subject of adulteration as that in Continental commerce. The substances which have been noticed in iodine by different writers and chemists are, *water, chloride of magnesium, chlo-*

*See a paper by Alfred B. Taylor, late Drug Inspector for this port, vol. xxii. pp. 193.

ride of calcium plumbago, coal, charcoal in fine powder, bruised slate, black oxide of manganese, sulphuret of antimony, sulphuret of lead (galena), iron scales, iodide of sulphur, sand and clay.

Water has been detected in proportions varying from 5 to 15 and even 20 per cent. in the commercial iodine. When the quantity is unusually large the presence of some deliquescent salt as chloride of calcium or magnesium, may be suspected. To detect its presence and proportion, first ascertain the absence of fixed impurities in the specimen, by heating a portion of it in a capsule. This being known, then weigh 100 grains of the iodine and triturate it intimately with 200 grains of fused (anhydrous) chloride of calcium, in a dry atmosphere, quickly put the mixture in a tarred capsule, and heat it to about the temperature of 250° or 300° until all the volatile matter has been driven off. Then weigh the capsule and contents, yet warm, deduct the tare, and any increase in the weight of the chloride may be attributed to water, which is retained by the salt at the temperature above stated.

The Edinburgh Pharm. considers two per cent. of water admissible, and states that 39 grs. of iodine mixed with 9 grs. of quick lime and 3 ounces of water, when heated short of ebullition, slowly form a perfect solution, which, if the iodine does not contain more than 2 per cent. of water, is colored yellowish or brownish yellow from excess of iodine, but if more than 2 per cent., the solution is colorless. This test merely proves that water is present beyond 2 per cent., and not the real per centage—and further, an impure or silicious lime would indicate the absence of water by being insufficient to combine with the intended amount of iodine.

Chloride of Iodine.—Dr. Herzog “considers it remarkable that this adulteration has not hitherto been noticed, since in the preparation of iodine on the large scale, metallic chlorides, which might give rise to the formation of chloride of iodine, are not always excluded.” This substance gives to iodine a strong disagreeably pungent smell, very similar to that of cyanide of iodine. When present, it quickly communicates to water, with which the iodine has been mixed, a brownish yellow color, and shows by its reaction the presence of hydrochloric acid. The quantity of chlorine is easily detected by converting 100 grs. into iodide and chloride, with water and iron filings, precipitating the iron with

carbonate of potassa, neutralizing the filtered solution with acetic acid and precipitating the chlorine as chloride of silver.

Cyanide of Iodine.—Dr. Herzog thinks that “the presence of cyanogen is due to the small marine animals, which are always unintentionally, or to the larger ones, which are intentionally mixed up with the sea plants from which kelp is prepared, and which upon being heated, form combinations of cyanogen with the carbonate of soda of the ashes.” The presence of cyanogen is determined by dissolving the suspected iodine in a solution of pure potassa, evaporating to dryness, heating to redness to decompose the iodate and cyanate of potassa, dissolving again in water, adding a mixture of sesqui and proto-chloride of iron till it ceases to precipitate. This precipitate is then treated with muriatic acid, and if any cyanogen was present, it will remain undissolved, as prussian blue (ferrocyanide of iron.) The directions of the new Dublin Pharm., (see p. 12 of this volume,) to subject iodine to a preliminary sublimation, has reference to the presence of cyanide of iodine, which constitutes the white acicular crystals referred to.

The Chlorides of Calcium and Magnesium are easily detected by the loss of weight which the iodine sustains when agitated with water, and by evaporating the aqueous washings to dryness, the amount of the impurity may be arrived at. If both chlorides are present, they can be separated by adding an excess of solution of bicarbonate of potassa, which precipitates the lime as carbonate, when the magnesia may be precipitated from the filtered solution by adding the carbonate of potassa in excess. Both of these adulterations are soluble in alcohol, and cannot be detected by the solubility of the suspected iodine in that fluid.

Plumbago is detected by its insolubility in alcohol, and by its sensitiveness to the attraction of the magnet, which will separate it from oxide of manganese, coal, charcoal, sulphuret of antimony, galena, sand and clay.

Black Oxide of Manganese.—If the black insoluble residue of the suspected iodine evolves chlorine when treated with muriatic acid, this oxide is present.

Sulphurets of Antimony and Lead may be detected in the residue, if present by the action of muriatic acid, which disengages sulphuretted hydrogen. The muriatic solution will cause a white

precipitate when added to water, if sulphuret of antimony is present. MM. Henry and Garrot assert that sulphuret of antimony mixed with iodine forms a *red* triple compound too unlike iodine to answer for an adulteration. It may be only the moist iodine that reacts in this way.

Clay, Sand and Slate, if present, may easily be detected by their insolubility in water and alcohol, and their insensibility to heat.

CORROSIVE SUBLIMATE.—Its great density, 5.42, satiny lustre, and crystalline structure, together with its solubility in ether, are marks by which its purity can readily be established. Both calomel and muriate of ammonia are left by the ether, as well as fused chloride sodium and potassium.

CALOMEL, PROTO-CHLORIDE OF MERCURY.—Calomel is a white powder of sp. gr. 7.14 to 7.20 insoluble in water, alcohol, ether and dilute muriatic and acetic acid. It is entirely sublimed by heat, is converted into protoxide of mercury by an excess of heat, which is then wholly soluble in acetic acid. Calomel has been adulterated with *carbonate, sulphate, and phosphate* of lime, *sulphate of baryta, carbonate of lead* and even *starch and gum*; it also sometimes contains corrosive sublimate as an impurity from carelessness. It is very easy for the physician and apothecary to assure themselves of the purity of calomel. *First* heat it to dull redness on a plate of iron; if it all vaporizes, the above insoluble adulterations are absent. The calomel should then be washed with warm water, and if the filtered washings produce no precipitate with ammonia or iodide of potassium, it is free from corrosive sublimate, and may be considered medicinally pure.

If a white residue is left after the calomel is sublimed by exposure to heat, it should be treated with diluted muriatic acid; if it dissolves wholly or partially with effervescence, either carbonate of lead or lime is probably present. If the solution is precipitated black by hydrosulphuret of ammonia, and yellow, by iodide of potassium, the base is oxide of lead; if not changed by these reagents and is precipitated white by oxalate of ammonia, the base is lime.

If the residue is more or less blackened, some organic matter

has been present, probably starch or gum. To decide, treat another portion of the suspected calomel, with hot water, and test with solution of iodine and sub-acetate of lead—the former will produce a blue coloration, with starch; whilst the latter will cause a white precipitate with gum.

SULPHATE OF ZINC.—White vitriol is in colorless and translucent crystals of varying size, having the form of four-sided prisms. Slightly efflorescent, but losing six-sevenths of their water of crystallization at 212° ; readily soluble in water, but insoluble in alcohol. The caustic alkalies and carbonate of ammonia produce in a solution of sulphate of zinc white precipitates, soluble in an excess of precipitant. The impurities found in sulphate of zinc, are iron, copper, cadmium and arsenic. The two former may be detected by adding, to a solution of the salt, a solution of ammonia in excess, when the presence of iron will be indicated by dark or red flocculi, and of copper by the smalt blue color of the solution. Cadmium and arsenic, by acidulating the solution with sulphuric acid, and passing a stream of sulphuretted hydrogen through it, when if either metal be present, it is deposited as a yellow sulphuret.

From these it may be purified by immersing a clean plate of zinc in its solution, and exposing it to the action of air until it ceases to deposit a yellowish-brown sediment. Sulphate of magnesia from similarity of form, may be used as an adulteration. It may be recognized by an excess of caustic alkali not redissolving the precipitate which it produces in its solution.

SULPHATE OF MAGNESIA.—This salt occurs in small acicular colorless crystals, which effloresce on exposure to air. Its taste is saline, bitter and nauseous. It is soluble in its own weight of cold water, but insoluble in alcohol. The alkalies and their carbonates produce white gelatinous precipitates in solution of sulphate of magnesia, insoluble in excess of the precipitant. The most common impurity found in epsom salt is iron. This may be detected by ferrocyanuret of iron producing a greenish or blue color. When, however, the iron is in the state of protoxide, or in small amount, the coloration is not immediately evident, but will appear gradually on exposure to action of the air; the quan-

tity of ferrocyanuret used should not be sufficient to give a yellow color to the solution. Chloride of magnesium is sometimes present, and gives a deliquescent character to the salt. If, by acting on sulphate of magnesia by alcohol, and evaporating the spirit, a solid residue be obtained, this chloride may be present and then this residue dissolved in water will yield with nitrate of silver, a white precipitate insoluble in nitric acid. Sulphate of soda is detected with more difficulty. If the salt be unusually efflorescent it may be suspected. One hundred grains dissolved in boiling water and decomposed completely by a hot solution of carbonate of soda, will yield a precipitate of carbonate of magnesia, which, when washed and dried, should weigh thirty-four grains; any deficiency would indicate sulphate of soda in proportion to the amount.

SULPHATE OF COPPER.—This salt forms translucent deep sapphire-blue crystals which effloresce slightly, becoming covered with a green incrustation; when moderately heated they lose water of crystallization, and fall into a pale blue powder. They are soluble in four parts of cold water, but insoluble in alcohol. The caustic and carbonated alkalies produce green precipitates in solution, of sulphate of copper, which are redissolved by an excess of ammonia and its carbonate. Sulphate of copper frequently contains iron, and sometimes in considerable amount. This may be detected by supersaturating its solution with liquor ammoniæ, when all the oxide of copper will be redissolved, and greenish black, or brown flocculi will be left, if iron be present. These flocculi are not distinct, if the iron be as protoxide or in small amount, the intense blue of the solution rendering them almost invisible; their presence may be set beyond doubt by filtering the deep blue solution and washing, when the oxide of iron will coat the inside of the filter with a yellow or brown film. Sulphate of zinc is said sometimes to be contained in sulphate of copper. To ascertain this, a solution of the salt is to be precipitated by solution of potassa, and an excess added by which the oxide of copper will not be touched, while any oxide of zinc will be redissolved; on filtering and adding to the clear liquid, a solution of bicarbonate of potassa or soda sufficient to convert the caustic into carbonate of potassa, white flocculi of oxide of zinc will appear. The solution of bicarbonate should be added very carefully with agitation, an

excess preventing the appearance of the precipitate, or redissolving after formation.

SULPHATE OF IRON.—Pure sulphate of iron is in the form of translucent rhombic crystals of a pale bluish green. In dry air it effloresces and becomes covered with a white powder, but the air being moist the color verges more or less on yellowish-brown. It is freely soluble in water, but insoluble in alcohol and strong sulphuric acid. Heated moderately it dissolves in its water of crystallization, nearly all of which gradually evaporates and leaves a white powder. At a higher temperature sulphurous acid is evolved and a subsesquisulphate formed, and finally at a red heat it loses all its acid, leaving a residue, the sesquioxide. The impurities generally found in green vitriol are sesquisulphate of iron, sulphate of copper and sulphate of zinc. Sesquisulphate of iron is indicated by the grass green hue of the salt, the depth of color increasing with amount of sesquioxide. When dissolved in water previously boiled to drive off dissolved oxygen, pure sulphate gives a white precipitate with ferrocyanuret of potassium, while the presence of a sesquisalt causes a greenish hue in proportion to the amount present. Sulphate of copper is detected by solution in water, adding an excess of solution of ammonia and filtering, when if this salt be present the filtrate will possess a smalt blue color. Sulphate of zinc is detected by the same means, and driving off the excess of ammonia by heat, when, if this salt be present, white flocculi of oxide of zinc appear. Sulphate of iron may be readily deprived of the first two impurities by agitating its solution with, or filtration through iron filings.

ON HYDRASTIS CANADENSIS.

By ALFRED A. B. DURAND.

(An Inaugural Essay.)

HYDRASTIS CANADENSIS.

Golden seal. Yellow root. Orange root. Yellow puccoon.

The *Hydrastis Canadensis* was known to the aborigines of North America, both as a medicine and as a dye. It is still used in

some parts of the country as a tonic, in the form of tincture, and in infusion as a topical application in ophthalmia and ulcerous inflammations. Its late successful exhibition by some of our city practitioners in inflammations of the mucous membrane, has led me to choose it as the subject of my thesis, with a view to investigate its chemical constituents, by means of a proximate analysis.

BOTANICAL DESCRIPTION.

The *Hydrastis Canadensis* is an herbaceous plant belonging to the natural order of *Ranunculaceæ*, and to *Polyandria Polygynia* of the *Linnean System*. "Its name is said to be derived from two Greek words, *ὕδωρ* water, and *αἰω* to act, in allusion to the active properties of the juice."

This plant is from six to eight inches in height, with a straight hairy stem, bearing two unequal leaves, the lower one petiolate, cordate, palmate, five to seven lobed, the lower one sessile and three lobed. The flower is solitary pedunculate, with three caducous reddish-white petals. The fruit is a compound berry of a red color, like that of the unripe blackberry. The root, which is the part used in medicine, is an oblong, thick and knotted rhizoma, of a yellow color, from which long fibres proceed. It has a strong narcotic odor, and an intensely bitter taste. The *Hydrastis* is indigenous to North America, rather rare in the Northern States, but found abundantly beyond the Alleghanies.

CHEMICAL EXAMINATION.

Two ounces of the bruised root were macerated in cold water for twenty-four hours, then placed in a displacement apparatus and half a pint of liquid obtained. This was of a deep brown color, possessing the intense bitter taste and strong narcotic odor of the plant. Neither litmus nor turmeric papers were affected by it. Pieces of linen rags dipped in the liquid were instantly dyed of a brilliant light yellow color, which resisted to a certain degree the action of dilute sulphuric, nitric, and oxalic acids, but yielded entirely to that of hydrochloric acid.

Albumen. The presence of albumen was evinced in this lixivium, by solutions of tannin and corrosive sublimate, and also by coagulation by heat.

Gallic Acid. The muriatic tincture of iron yielded a greenish precipitate, indicating tannic or gallic acids, but solutions of quinia and of gelatin producing no change in the lixivium, it was inferred that gallic acid alone was present.

Starch. The dregs remaining on the filter were next boiled in water for about fifteen minutes and allowed to cool. To the filtered decoction, a few drops of tincture of iodine were added, which produced the color characteristic of the presence of starch.

Fatty Resin. One ounce of the powdered root was subjected to the action of sulphuric ether for a week, and then filtered. The tincture, but slightly colored, yielded on evaporation a fatty resin insoluble in water, and almost tasteless.

Yellow Coloring Matter. A tincture was made by digesting two ounces of the bruised root in eight ounces of alcohol for three days. The filtered liquor was of a reddish-brown color, less bitter than the aqueous infusion by maceration, but still possessing in a marked degree, the strong narcotic odor.

On evaporation to dryness, it yielded a fine garnet colored extract, partly soluble in water, imparting to that menstruum a brilliant yellow color.

To the alcoholic tincture a solution of bichloride of tin was added, forming a most brilliant yellow precipitate. The same test added to the aqueous infusion produced a dirty yellow precipitate, much inferior, in brilliancy of color, to that obtained from the alcoholic tincture.

Aqueous Extract. Ten thousand grains of the bruised root were macerated in cold water as long as the liquid exhibited a bitter taste. This was next evaporated on a water bath to about a pint, and filtered, to separate the coagulated albumen and oxygenated matter that had precipitated. It was again carefully evaporated to dryness, yielding a deep brown extract weighing 1920 grains.

Dry Acrid Resin. The residuum left on the filter in the above experiment, was dried at a temperature of between 90° and 100° Fahr.; then treated with rectified alcohol. A light brown colored tincture was obtained, which on being evaporated to dryness yielded 140 grains of a dry and brittle resin, of a disagreeable soapy and bitterish taste, leaving a strong acrid impression in the fauces.

Ligneous Matter. The dregs were next boiled with water, to which they still imparted the taste, odor and color of the plant, but after exhausting them perfectly, I was compelled to set them aside for several days, to attend to the duties of the store, during which time both the decoction and dregs underwent fermentation, thus putting an end to an experiment intended to ascertain the relative quantity of soluble matters and lignin existing in the root of the Hydrastis.

INVESTIGATION OF THE AQUEOUS EXTRACT.

The aqueous extract possessed the bitterness and strong narcotic odor of the plant. It was perfectly soluble in cold water, sparingly so in cold alcohol, but boiling alcohol dissolved about one-half. These solutions were all neutral and more or less colored.

The portion taken up by the alcohol evaporated to dryness yielded a garnet colored extract of intense bitterness, far surpassing that of the other half. It dissolved readily in water, to which it imparted a bright yellow color. This alcoholic extract seems to bear the same relation to the original extract that commercial ergotine does to the aqueous extract of ergot, and to contain all the active properties of the plant combined with the coloring matter.

Sugar.—The portion of the aqueous extract not taken up by the alcohol was black, affording with water a dark-brown solution much less bitter and odorous than the other; subjected to a strong heat it was decomposed, emitting the peculiar odor of burnt sugar.

500 grains of the aqueous extract were dissolved in eight ounces of water, to which 125 grains of magnesia were added, and the whole digested on a sand bath for two hours; then filtered, and the residuum washed with water and dried. This was digested in boiling alcohol and afterwards filtered. The liquor was now set aside to evaporate spontaneously and afforded after twenty-four hours, beautiful four-sided prismatic crystals terminated by pyramidal summits. These were separated from the mother-liquor which after a few days yielded a new crop of crystals larger than the former, but of a prismatic tabular form.

125 grains of the same extract were dissolved in four ounces of water, and the solution treated with basic acetate of lead until it ceased to produce a precipitate. This was separated by filtration,

and the liquid portion submitted to a stream of sulphuretted hydrogen, to eliminate the lead. The supernatant liquor was evaporated to dryness, in order to get rid of the excess of sulphuretted hydrogen, and the acetic acid left by the decomposition of the salt of lead. The extract thus obtained treated with boiling alcohol, yielded by spontaneous evaporation an extractive matter intermixed with crystals resembling those obtained by magnesia, but which I did not succeed in isolating. [Acetate of Hydrastia?—ED.]

125 grains of the aqueous extract were again dissolved in four ounces of water, and one ounce of animal charcoal was digested with the solution for about six or eight hours. It was then filtered and the residuum washed and dried. This was then treated with boiling alcohol, which on spontaneous evaporation produced an extractive matter of intense bitterness, also intermixed with crystals identical with those of the preceding experiment.

EXAMINATION OF THE CRYSTALLINE SUBSTANCE.

The first crystals were of brilliant yellow color, insoluble in water, sparingly so in cold ether and alcohol, more so in ether when hot, entirely dissolved by chloroform and boiling alcohol.

Litmus paper previously reddened by an acid immersed in these solutions was restored to its natural blue color. Nitric acid dissolves the substance perfectly, decomposes it, and assumes a deep red color. Muriatic acid dissolves it without alteration; sulphuric acid affects it slightly when cold, but when hot decomposes it, and becomes changed in color to purple. Vapor of iodine changes the crystals to a deep brown color; heated in oil of turpentine they fuse, somewhat coloring the oil, and a slight opacity occurs when the solution cools. Water and alcohol acidulated with sulphuric, nitric, hydrochloric, acetic, and oxalic acids dissolved them perfectly, gradually diminishing the acid reaction, but not however completely so.

These solutions were intensely bitter, and on evaporation yielded amorphous white granules, the mother water which covered them changing to an oily viscous fluid, of a bitter acid taste, which was ultimately converted into a brittle and transparent resinous mass of an amber color. All these solutions were precipitated by ammonia and tannic acid. Subjected to the blow pipe flame in a platinum capsule the crystals burned with a yellow flame, puffing

up in a carbonaceous mass, which disappeared entirely by protracted heat, proving them to be of organic origin.

Two grains of the crystals were next mixed with thirty grains of caustic potassa placed in a test tube and submitted to the flame of a spirit lamp, when the odor of ammonia was soon made sensible, proving the presence of nitrogen. The second crop of crystals were different, as before mentioned, in the form of crystallization and in color only; in all other respects they were identical with the first. All the experiments are not sufficiently conclusive to pronounce on the nature of the crystals. They certainly possess many characteristics of organic bases, such as to contain nitrogen, to restore the blue color to litmus paper previously reddened by an acid, to dissolve in acids, and be precipitated from their solutions by ammonia and by tannin; but so far, I have not been able to reach the most important point, that is, to obtain crystals from their solutions in acids, nor to experiment on the amorphous granules yielded by the evaporation of their solutions with the view to ascertain whether they were formed by the combination of an acid with a base, or merely the substance itself deposited by evaporation from a mere solution in an acid. For the present I shall therefore call the substance *Hydrastin*, with the hope that I will be more successful, after repeating my experiments on a larger scale, in fully establishing its rank among the alkaloids, and in conformity with our nomenclature change its present name of Hydrastin to that of *Hydrastia*.

EXAMINATION OF THE ASHES.

Potassa. One thousand grains of the bruised Hydrastis were incinerated in a covered crucible, and forty-four grains of ashes obtained. They were first treated with boiling water, to a portion of which a solution of tartaric acid was added; no effervescence was manifested, and a crystalline precipitate of bitartrate of potassa was revealed. The presence of potassa was further confirmed by producing precipitates on the addition of solution of nitrate of silver and bi-chloride of platinum. Oxalate of ammonia rendered the liquor slightly turbid. Ferrocyanide of potassium did not evince the presence of iron.

Carbonate of Lime.—The insoluble portion remaining on the filter, was then treated with boiling water acidulated with hydro-

chloric acid producing a brisk evolution of carbonic acid. On the addition of oxalate of ammonia a copious precipitate of lime was instantly produced.

Iron.—With the ferrocyanuret of potassium a deep blue color was evinced, indicating the presence of iron.

Alumina.—A solution of ammonia produced a gelatinous precipitate insoluble in excess of the alkali, but soluble in caustic potassa, evincing the presence of alumina. As this substance is of rare occurrence in a vegetable analysis, I am inclined to believe that it was furnished by the earth attached to the root.

Magnesia.—Phosphate of soda produced a cloudiness immediately precipitated by the addition of ammonia revealing the presence of magnesia. From the above experiments, the constituents of the root of the *Hydrastis Canadensis* may be summed up as follows: Albumen, gallic acid, starch, fatty resin, yellow coloring matter, extractive matter, dry acrid resin, ligneous matter, sugar, *Hydrastin*, potassa, iron, carbonate of lime, and magnesia and alumina probably in the state of phosphate. The inference to be drawn from the above analysis by the practitioner of medicine, is that the *Hydrastis Canadensis* is not, properly speaking, an astringent remedy, as it seems to have been considered to this day, but that it acts in the manner of certain narcotic bitter substances, by soothing irritation, giving tone to the mucous membranes, and producing a healthy reaction. I know nothing of the activity of the crystalline principle hydrastin, not having had as yet occasion to have it tried by the practitioner of medicine, but I would recommend, in preference to any other preparation of the root, the alcoholic extract obtained from the aqueous extract, as it seems to possess in a high degree all the active properties of the root in a concentrated form.

Whether I have contributed to enrich the materia medica by this analysis, and vegetable chemistry by the addition of a new organic principle is yet to be decided, but I have every reason to believe that the coloring matter of the *Hydrastis* will prove to be useful in the arts as a dye. It imparts to linen a rich and durable light yellow color of great brilliancy, which might probably by proper mordants, give all the shades of that color, from the pale yellow to the orange. The lake produced by the bi-chloride of tin might also prove a useful pigment in oil and water painting.

FLUID EXTRACT OF SERPENTARIA.

BY JOHN B. SAVERY.

(An Inaugural Essay.)

The Virginia snake-root has, since its first introduction into the *materia medica*, been regarded as a valuable remedy in some forms of disease, but its use has in some measure been confined to domestic practice, and it has received less attention from members of the medical profession than its merits would seem to demand.

Growing as it does in great abundance in our own country, a supply of it is always on hand without those difficulties, which, under some circumstances might attend the introduction of foreign drugs. In the treatment of all cases in which our indigenous plants may be substituted for those of foreign origin, there is an obvious advantage in their employment from the reason above stated, viz., the uniformity and certainty of the supply.

Under these circumstances, and with a view to the increasing use of *Serpentaria*, it becomes a matter of some consequence to determine upon the best mode of administering it. The United States Pharmacopœia directs a tincture of the strength of one and a half ounces to the pint; but this, although in some cases it may no doubt be properly employed, is liable to objections. The quantity of alcohol necessarily taken, in order to produce the effect of a full dose of the root, might, under some circumstances, have an injurious tendency.

The favorable opinion which is entertained by the medical public of some of the fluid extracts which have within a few years been introduced into the list of pharmaceutical preparations, has induced me to undertake a series of experiments with a view of ascertaining whether a similar extract could be prepared from *Serpentaria*, which would be without the disadvantages above mentioned as appertaining to the tincture.

The principles upon which the virtues of this drug depend, are stated to be resin, bitter extractive, and volatile oil; the latter existing in such extremely minute quantity (1-20th of one per cent) as to render it very doubtful whether it has any effect on the system. In order to obtain an extract which should contain in a concentrated form, the whole of the two first mentioned principles,

with as little loss of the volatile part as possible, a number of methods were tried. The individual details of these experiments it is unnecessary to mention, but the opinion formed from their general results was that the most simple mode of operating, was the best, and that on extract made by the following formula, was the most perfect preparation :

Take of Virginia Snake-root,
Sugar in powder, each eight ounces.
Water,
Alcohol, each a sufficient quantity.

The root is to be finely ground, and after having macerated for a day or two in a pint of alcohol, is to be introduced into a displacer, and diluted alcohol poured on it until four pints shall have passed. The tincture thus obtained should be evaporated with a gentle heat and constant agitation until it measures twelve fluid ounces. The sugar is then to be dissolved, and the whole to be strained through flannel.

The object of using strong alcohol for obtaining the first portion is to insure the solution of the whole of the resin, some of which might be left behind if the whole of the menstruum contained a proportion of water.

If any separation of resin or other matter should occur during the process of evaporation, which is sometimes the case, it will generally be suspended or redissolved on the addition of the sugar.

By the exercise of a reasonable amount of care in evaporating, the dissipation of the volatile principal can, in a great measure, be avoided, for a specimen of the extract prepared as above, was found to possess little or no power of imparting any of its original peculiar properties to ether, boiling water, or other menstruum, thus proving that the virtues of the root were all extracted by this mode of treatment.

Serpentaria being often employed in combination with other substances as cinchona, gentian, &c. ; an extract might be made containing their activity, by varying this mode of preparation in accordance with the peculiar characteristics of the drug to be combined with it.

The dose of this extract will, of course vary according to the nature of the case in which it is used; it should not, however, be

administered in doses much larger than half a drachm each, two fluid ounces of it containing the activity of one ounce of the root.

It may be observed that in the selection of serpentaria for this or indeed, any preparation, care should be taken to have it free from *ginseng* or any of the other accidental foreign matter, so frequently found in the bales of the commercial article.

PRACTICAL OBSERVATIONS.

By R. H. STABLER, Alexandria, Va.

Believing the result of some observations made while engaged in the daily duties of a practical pharmacist might be acceptable to the readers of the Journal, and in hopes that they may elicit similar communications from others engaged in the profession, is my excuse for penning the following essay.

Powdered Drugs. The facility of adulterating powdered drugs so as to escape detection, is a strong temptation to many wholesale dealers and drug grinders to furnish inferior articles at a less price than the pure articles can be obtained for; for this reason many retailers and dispensers prefer selecting drugs in their crude state, and powdering them when wanting; thus avoiding the liability to deception. Being in this practice, I have observed an easy method of obtaining powdered squill root. This drug can be powdered to better advantage in cold weather; if kept in a dry atmosphere of about 90° F. for three days, it becomes brittle, dry, and easy to reduce to the requisite degree of fineness. My method has usually been to run it through Swift's drug mill first, sift it, then finish in the mortar and spring pestal; lastly, bottle in perfectly dry and warm bottles, cork and hermetically seal them, then cover with blue paper to prevent the injurious action of light.

Powdered Opium, is seldom prepared from the best gum, and I believe it is more difficult than any article in the materia medica to obtain ready powdered of the wholesale dealer, of good quality. The custom with a great many, is to select the

best pieces for sale, and use the inferior sort, together with capsules and dregs of the case, for powdering. Every dispenser ought to powder his opium, and if he will select cold weather for the operation, it is attended with little difficulty : slice the opium in thin pieces and expose it in the drying chamber, to a temperature of about 100° F., until it becomes brittle and easy to reduce, and protect the powder when finished in the manner described for powdered squill root.

Powdered Ergot is so liable to decomposition that many druggists do not keep it ready for dispensing, preferring to powder it fresh when called for. It is often of the greatest importance that it should be furnished expeditiously. In uterine hemorrhage after delivery, for instance, where a few moments may determine the result in life or death, impressed with the importance of being able to keep it on hand, and to protect it from change, I was glad to adopt the following suggestion met with in Dr. Dunglison's work on new remedies, and have found it entirely successful. "To prevent the formation of the parasites, Mr. Rawle keeps a small piece of camphor in the stopper bottle which contains the ergot. This soon annihilates the whole race of insects, and adds greatly to the certainty of the effect of the medicine. This plan had been recommended before by Dr. Bright. It has been advised that the camphor should be admixed with the ergot in the proportion of a grain to a scruple."

In adopting this suggestion I have found it sufficient to introduce camphor,* tied up in a piece of muslin; the whole mass soon becomes pervaded with the smell. Whole ergot is effectually protected from the acarus by adopting this plan.

Tincture of Chloride of Iron, prepared by the present formula speedily undergoes change, depositing peroxide of iron, and depreciating in strength. This is effectually prevented by adding a portion of honey, and less alcohol, to preserve the officinal strength. The following modification of the officinal formula I have made use of for some time past, and find it to yield a permanent preparation, viz. :—

*In another part of this number, a suggestion to employ chloroform to kill and preserve cantharides will be found. We think that chloroform vapor would act with equal effect on the depredators of ergot.—EDITOR.

Take of Subcarbonate of Iron,	6 ounces
Muriatic acid,	1 pint,
Alcohol,	2 do.,
Strained honey,	1 do.

Pour the acid upon the subcarbonate of iron, and shake the mixture occasionally for three days; then set by, that the dregs may subside; lastly pour off the liquor and add to this the alcohol and honey previously mixed.*

Ointment of Red Oxide of Mercury soon loses its fine red color, as ordinarily prepared. To remedy this it has been suggested to prepare the simple ointment or lard by digesting it on poplar buds; or to dissolve a portion of benzoic acid in it, both of which methods are effectual, but attended with some trouble. A more simple and equally effectual method is, to add two drops of liquor potassæ to each ounce of the freshly prepared ointment.†

Tincture of Kino. Having experienced the difficulty of preserving this tincture from undergoing change in constitution,

* We dissent from the author in regard to the presumed advantages presented by the above formula. It was the design of the originators of the preparation to get a sesquichloride of iron in alcoholic solution. The Dublin Pharm: (1826) directs rust of iron. The Edinburgh Pharmacopœia, 1841, directs red oxide of iron. The Codex directs sesquichloride of iron to be dissolved in alcohol. The new Dublin Pharmacopœia, the latest British Pharmacopœia published, directs a solution of sesquichloride of iron to be made by dissolving iron wire in muriatic acid, and converting the protochloride of iron into sesquichloride, by adding nitric acid. The only reason for using subcarbonate of iron, is, that it is the most convenient and most soluble form of sesquioxide, obtainable. The reason the tincture precipitates, is because a small quantity of protochloride of iron is formed from the four or five per cent of carbonate of the protoxide that the subcarbonate contains, and this is slowly converted into sesquichloride and sesquioxide, which precipitates. The Pharmacopœia U. S. for 1850, gives a process for making this preparation in as many hours as that of 1840 requires days. Hence the design of the author in employing honey is of little use, and accomplishes nothing beyond preventing the decomposition of a little protochloride of iron, which had better be absent than present.—
EDITOR.

† The same preservative effect is derived from liquor potassæ, when added to iodide of potassium ointment—the elimination of free iodine and consequent coloration of the ointment, being prevented by the alkali.—
EDITOR.

and from gelatinizing, when prepared by the U. S.* process, I determined to adopt the suggestion of Benjamin Canovan, in the *American Journal of Pharmacy* for 1849, and can say it has proved entirely successful.

If prepared with diluted spirit as proposed, instead of rectified spirit, which is in the officinal formula, I believe it is as permanent as any of our vegetable tinctures. A sample of tincture of kino, made more than seven months ago, has yet shown no tendency to gelatinize.

ON A NEW SOLVENT FOR EXTRACTING CANTHARIDIN, AND ON
THE EXISTENCE OF THAT PRINCIPLE IN CANTHARIS VIT-
TATA AND MYLABRIS CICHORII.

BY WILLIAM PROCTER, JR.

The remarkable solvent power possessed by chloroform that has already been developed, and especially the discovery of Roubin, that some of the vegetable alkalies come within its capacity, led me to query whether it would not also dissolve the active principle of cantharides. On making the trial with some pure cantharidin it was found to dissolve it with great readiness.

An ounce (480 grs.) of Spanish flies in powder, and two ounces of chloroform, were macerated together for forty-eight hours, and thrown on a glass percolator, the diaphragm of which consisted of a thick sheet of lint, and fitted with a cover to prevent loss by evaporation. The superior density of the menstruum causes the flies to float in it, for which reason it is better, after the solution has

*The author probably means the *London* process, as it is not officinal in the U. S. P., 1840, though introduced into that for 1850 with diluted alcohol as a menstruum. Notwithstanding the testimony of the author and Mr. Canovan, experience has abundantly proved that the fault lies in the nature of the kino-tannic acid, which will change by exposure to air, and lose its astringency. Diluted alcohol may render the process less rapid—but a bottle now on our own shelf made with that menstruum, is as completely gelatinized as a mass of crassamentum. The closer the stop bottle, is stopped, the slower will the change occur, and when hermetically sealed, we have kept it eight years without loss of fluidity or astringency.—Editor.

drained off, to place a heavy diaphragm on the flies, and return the solution to the percolator; after it had passed a second time, a little chloroform was added, and finally alcohol .835, until all the first menstruum has passed, which is known by the difference in density and color of the alcoholic liquid, which contains the brown color left by the chloroform.

By spontaneous evaporation, the dark green chloroform solution yielded a crop of crystals of cantharidin, admixed with the green fixed oil peculiar to the insect; the whole residue weighed 43 grains. After standing 48 hours, that the crystals should have time to separate, the whole was thrown on several thicknesses of filtering paper to absorb as much as possible of the oil. The crystals were then dissolved in a mixture of chloroform and a little alcohol, and by spontaneous evaporation were obtained in nearly a pure form.

The particular merits of chloroform as a menstruum in making cantharidin, are, that it is a better solvent than ether or the oils; that a less quantity can be used with more effect, employing alcohol to displace it, and that the cantharidin crystallizes more readily from chloroform than from ether. The expensiveness of chloroform precludes its use in the preparation of the ordinary blistering liquids, or tissues, but where the object is to isolate the cantharidin, the advantages above mentioned, together with the fact that most of the chloroform may be regained by distillation, will render its use altogether eligible.

Cantharis vittata.—Not being aware of any chemical examination of this insect with a view to demonstrating the existence of cantharidin in it, I have applied the solvent property of chloroform to this purpose. One hundred and twenty grains of the flies, reduced to powder, were percolated with chloroform, slowly added, until three times the weight of the flies had passed. The tincture had a greenish brown color, the brown predominating. A few drops of this by evaporation on glass, deposited a coating of minute crystals visible to the eye, and their shape discoverable with a common lens. The whole of the chloroform solution was then suffered to evaporate in a suitable vessel, and yielded a residue of 12 grains. This consisted of crusts of minute crystals admixed with a greenish brown fixed oil, the latter in much less quantity than the green oil obtained in the same manner from Spanish flies.

The whole was laid on thick filtering paper to absorb the oil, the crystalline matter dissolved in a little chloroform and alcohol mixed, which by spontaneous evaporation yielded it in a much purer form, though not entirely colorless. The cantharidin appears to be associated with less fixed oil in the potato fly, than in the Spanish insect; the oil has much less color and is more fluid. The cantharidin separates in sword shaped prisms, terminated obliquely.

Mylabris cichorii.—Having in my possession a specimen of the Chinese blistering fly, *Mylabris cichorii*, the same trial was made with it. One hundred and twenty grains, in powder, was percolated with chloroform till exhausted. The solution possessed a deep brown color, without a tinge of green. A few drops evaporated yielded a crop of crystals admixed with a transparent brown oily matter. The crystals were larger than those yielded by either of the preceding flies under the same circumstances. The tincture was then suffered to evaporate spontaneously, and yielded an oily crystalline residue, weighing 14 grains. The crystalline matter was separated from the brown oil by absorption with filtering paper, and was purified in the same manner as in the preceding experiments. The crystals corresponded in shape with cantharidin from the two varieties of cantharis.

In stating the weight of chloroform extract obtained from each of the three species of insects examined, no conclusive evidence can be drawn relative to their activity, as in the two first experiments the flies were not exhausted. Besides the amount of oil and coloring matter varies, and as the whole of the cantharidin in neither case was isolated from the extract, its absolute amount is undetermined. The fixed oil must be well pressed out from the crystals before purifying them by recrystallization.

In order to feel assured that the substances obtained were really the blistering principles of the insects, a small quantity of each mixed with a little oil was applied to my arm, and left on for eight hours. Vesication had occurred before their removal in each instance, but more perfectly with the Spanish and Chinese flies than with the indigenous variety, owing, as was afterwards observed, to the crystals of cantharidin in the latter substance not being properly comminuted and disseminated through the oil. On the application of cerate, however, they were all equally developed.

ON THE EXTRACTION OF CHLORIDE OF SODIUM FROM THE
SALT GROUNDS OF THE CAPE DE VERD ISLANDS.

BY J. COLEMAN MORGAN.

As is well known, the Cape de Verd Islands have a soil highly impregnated with salt. The amount of impregnation varies in the different islands, and it is worthy of remark that it is greatest in those whose surface is nearly flat. For instance, the mountainous region of St. Jago, (whose principal town, Port Prayo, is the rendezvous of coast-bound vessels,) affords a quite pleasant and tolerably pure water, which is conveyed to a spot near the sea-side for the use of ships and the inhabitants; while, in the flat country of the Isle of Sal, there is no fresh water whatever, and its 200 inhabitants are obliged to obtain supplies of brackish water by boats which ply daily to the Isle of Bona Vista, which is in sight and of some elevation. The Isle of Sal, (the main salt ground) as are all the group, is peopled, to some extent, with Portuguese convicts, who, under the control of an overseer, work in the salt fields. These require description. They are each about one-half a mile square, and are surrounded by embankments, of which one, running through the whole, supports a railway used for the purpose of transportation. In each field, are a number of artificial springs or wells furnished with wooden pumps of very rough construction, standing 100 or 200 feet apart. These pumps have attached to their several piston rods, a crank, &c., connected with a kind of windmill, with sails of thin wood, of only about 12 feet diameter, but which, impelled by the great force of the N. E. trade-wind that is blowing constantly, raise many gallons of water in a short time. As this is discharged, it is conducted by troughs, dug to the depth of a few inches in the earth, into vats, which I found by measurement to be 17 feet long, by 6 wide, and 10 in. deep. These are allowed to fill, the supply is cut off, and the salt is allowed to crystallize by the evaporation of the fluid portion of the brine. The brine (whose strength, however, I did not determine more closely) contains, I judged, about twenty per cent of the salt, and it may well be supposed, is intensely acrid to the taste.

The contents of the vat having commenced to crystallize, the process is hastened by frequent agitation with a wooden hoe, and the salt when formed is dried and thrown up in heaps on the embankments for transportation. When this is required it is transferred by the workmen to large boxes set on truck cars, drawn into the town by asses, and deposited near the sea-side in extensive heaps. From these the droghers are loaded; the salt being conveyed in boats which receive it at the end of a wharf, which is composed of the wreck of an old barque, (the *Ariel*, of Boston) extending through and beyond the surf. Some other of these islands also furnish quantities of this commodity, but none so much as that just spoken of.

ON THE VOLATILE OIL OF NUTMEGS.

By G. G. MITSCHERLICH.

From a series of experiments with *ol. nucistæ æthereum* on rabbits, Mitscherlich draws the following conclusions:—

1. The volatile oil of nutmegs is a strong poison; for six drachms of it killed a middle-sized rabbit in the space of $13\frac{1}{2}$ hours; two drachms killed a strong rabbit within five days; one drachm killed a small rabbit in about thirty hours; one drachm of the oil injected into the stomach of a full-grown rabbit made it sick and ill for several days, after which it recovered. The volatile oil of nutmegs is weaker in its action than the oils of mustard, savine, and caraway, and is stronger than the oils of fennel, lemon, turpentine, juniper and copaiba, but is nearly equal in strength to the oil of cinnamon.

2. The oil of nutmegs is absorbed, and appears to undergo a change in the blood, and passes out in this altered condition in the urine, to which it imparts a peculiar, pleasant, aromatic odor. Neither the natural odor nor the changed odor could precisely be discovered in the blood or in the breath.

3. The oil of nutmegs produces in the stomach and jejunum a similar alteration of structure to that of the oils of caraway, fennel, lemon, turpentine, juniper, copaiba, bitter almonds, and cinnamon. In the stomach extravasation of blood and formation of blood-vesicles on the mucous membrane, which was partly softened and devoid of blood, without being inflamed in the adjacent parts. The interior of the duodenum was much divested of epithelium and filled with mucus. In the first experiment, with the enormous dose of six drachms, the stomach and the jejunum were injected with blood.

4. The most important symptoms of poisoning were frequent and powerful pulsation of the heart; slight acceleration of breathing; at first restlessness, afterwards weakness of the muscles, but considerably less than from oil of cinnamon; little or no diminution of sensibility, evacuation of hard fæces from the colon: ejection of a peculiarly smelling sanguineous urine after smaller doses, but no increased diuresis; decrease of strength and of the pulsation of the heart; difficult breathing; diminished heat in the external parts; death without convulsions. Death was produced by the absorption of the volatile oil.

Effect of the Oil of Nutmegs upon the Skin of the Human Body.—Part of the dorsal surface of the hand was moistened with the volatile oil of nutmegs. After about four minutes a very slight burning sensation was felt, which gradually increased, so that after fifteen minutes it became very unpleasant, and on being touched the reddened spot caused much pain. After thirty minutes the moistened spot was red; it burnt like after a sinapism when the skin is moderately reddened. Upon being washed the burning sensation disappeared within an hour; the epidermis did not scale off. In a second experiment with another individual, the symptoms were much slighter, the burning appeared only after ten minutes, and became rather strong after another ten minutes; the hand being then washed after thirty minutes, the burning sensation was still very intense, but the skin was not red. The burning sensation continued for about half an hour: the epidermis did not scale off.—*London Phar. Jour.* Jan. 1, 1851.—*From Buchner's Rep.*, vol. xvi. 1851, p. 104.

ON THE CHEMISTRY OF ASSAFÆTIDA.

By HLASIWETZ.

If assafætida be treated with strong alcohol, the resin and volatile oil are completely dissolved, the gum and impurities (consisting chiefly of gypsum) remain behind.

From the alcoholic tincture, the alcohol and volatile oil may be separated from the resin by distillation, so that the latter remain behind almost inodorous. If the distillation be performed with water in a copper still with a tin head, the tin becomes strongly acted on by the sulphur contained in the volatile oil. The distillation was, therefore, afterwards undertaken in a large glass retort, heated in a salt-water bath, in order to avoid the burning of the residue.

One pound of assafætida of the best quality yielded, on the average, one ounce of volatile oil, equal to about three [6 ?] per cent.

The volatile oil of assafætida is a thin fluid of a light yellow, clear, and of a penetrating smell. It is very readily dissolved by strong alcohol; water also takes up a considerable quantity of it, from which reason the *aqua assafætida* is particularly rich in oil, and has an acrid taste. Hlasiwetz found also valerianic acid and metacetic acid in it. The volatile oil of assafætida does not redden the skin as some other oils do which contain sulphur; it is also neutral to test paper. After it has stood for some time it evolves a large proportion of sulphuretted hydrogen; this property it imparts to crude assafætida. It does not congeal by artificial cold. Its boiling point cannot be exactly determined, for when heated, it develops, before and during boiling, sulphuretted hydrogen, and becomes thus decomposed. This boiling, however, takes place at 130° to 140° C. When fresh, it consists of carbon, hydrogen, and sulphur, without oxygen; but if exposed for some time to the atmosphere, it becomes slightly acid, and its odor is slightly altered.

Repeated analyses of the crude volatile oil, have shown that its percentage composition varies with the method of obtaining it, and according to its age; the carbon varied from 64.24 to 69.27; the hydrogen from 9.09 to 10.48; the sulphur from 20.17 to 25.43 per cent., so that according to these results, a compound of

a higher and of a lower proportion of sulphur with one and the same radical, may be calculated according to the following formulæ :—

I.	II.	III.	IV.
$C_{12} H_{11} S_2$	$3 (C_{12} H_{11} S_2)$	$5 (C_{12} H_{11} S_2)$	$C_{12} H_{11} S_2$
$C_{12} H_{11} S$	$C_{12} H_{11} S$	$2 C_{12} H_{11} S$	$2 (C_{12} H_{11} S)$

Dr. Hlasiwetz has examined the relations of this oil to various agents, *e. g.*, ammoniacal gas, liver of sulphur, muriatic acid, chlorine gas, nitric acid, chromic acid, sulphurous acid, potassium, lime, soda, oxide of silver, oxide of lead, and chloride of platinum, and analyzed most carefully the numerous results he obtained.

The resin of assafœtida is dirty white; in the air it soon becomes pink-red; in concentrated sulphuric acid it is dissolved with a green color; water throws it down from this solution in the form of pink-red flocculi; heated in a retort, it loses first the water adhering to it and a small quantity of volatile oil, which possesses a smell of assafœtida. At the same time it froths much, and develops sulphuretted hydrogen. As soon as all the water is expelled the froth disappears, the resin becomes dark-brown and boils steadily. The oils which now distil over during the decomposition of the resin are partly green, blue, violet-red, and of a more or less aromatic smell; diluted caustic potash lye is colored yellow by them and becomes turbid. The violet portion communicates to the potash lye an oil, which becomes intensely red in the air. The potash liquor with which the oils have been washed, contains, besides sulphuretted volatile oil, chiefly formic acid, and a trace of acetic acid.

The gum of assafœtida is, when dry, grey and horny, and yields, by dry distillation, formic acid with a small quantity of acetic acid and a kind of tar, containing sulphur.

Formic acid and acetic acid were also obtained by treating the red volatile oil of assafœtida with caustic soda. Valerianic acid and metacetic acid could not be discovered in it. But upon heating the soda-lime in the oil-bath to $200^{\circ} C.$, and allowing the volatile oil to drop on it, a volatile oil of a smell similar to lavender was formed, and valerianic acid, together with metacetic acid

and acetic acid remained behind in combination with the soda, lime.—*London Phar. Jour. Jan. 1, 1851.*—*From Buchner's Rep.*, No. xvi., 1851, p. 83.

MEANS FOR KILLING, AND PRESERVING CANTHARIDES.

BY M. LUTRAND.

Instead of killing these insects by the use of vinegar, which necessarily extracts a certain quantity of their active portion, M. Lutrand recommends that the flies be introduced into a deleterious atmosphere. He employed successively carbonic acid, sulphurous acid, chlorine, nitrogen, hydrogen, ammonia, empyreumatic oils, the volatile oils of the Labiateæ, camphor, naphthalin, creasote, valerian, chloroform, ether, aldehyd, &c. and determined with care the mode of action of each of these substances.

The author was particularly pleased with the effects of chloroform. This agent kills all insects that respire its vapor, with a remarkable promptitude, and much difficulty is presented so to graduate its effect that they will revive afterwards.

This being the case he feels himself authorized to say, that if the recommendation of a physician of Pont-de-Vaux, (Avril 1849) to employ chloroform to asphyxiate bees when collecting the honey, be followed, there will be a danger of killing them; and he asks whether in this case the use of carbonic acid gas would not be preferable.

This gas produces but a momentary suspension of animation in cantharides. They fall into a sort of sleep or torpor which passes off when they are exposed to the air. This revivification occurs with equal readiness after the cantharides have remained in the gas a long time.

M. Lutrand also recommends chloroform as a means of preserving cantharides, and he considers it superior to any substance that has hitherto been recommended for this purpose. He considers it worthy of a place among the appliances used by the collector of insects, and the preparer of specimens of natural history.—*Journal de Pharmacie, Sept. 1850, from Acad. des. Sci. de Montp.*

ON THE MYROSPERMUM OF SONSONATE, FROM WHICH BALSAM OF PERU, WHITE BALSAM, AND BALSAMITO ARE OBTAINED.

BY JONATHAN PEREIRA, M. D., F. R. S.

[In the November and December numbers of the London Pharmaceutical Journal, Dr. Pereira has given a very elaborate investigation of the botanical history of the plants to which the Balsam of Peru has been attributed by different writers and botanists; followed by a description of a species of *Myrospermum*, growing in Central America, which Dr. P. considers as the true source of the drug, and which, for the present, he calls the *Myrospermum* of Sonsonate, the specific designation being taken from the geographical locality of the tree. We had, in common with most others who had not given special attention to the subject, presumed that the Balsam of Peru was derived from the north-west part of South America, and perhaps originally from some part of Peru, until the appearance of M. Guibourt's paper in the *Journal de Pharmacie*, Feb., 1850. It is with much interest, therefore, that we have read the papers of Dr. Pereira, especially the last one, from which mainly the following notice is taken, which has reference chiefly to the *Myrospermum* received and described by Dr. Pereira, from Mr. Skinner, late of Guatemala; referring those of our readers who may desire to investigate the botanical details of the subject, to the original papers in the *Pharmaceutical Journal*.—EDITOR.]

In the last number of the *Pharmaceutical Journal* I stated, that I had received from Sonsonate a species of *Myrospermum*, from which Balsam of Peru, White Balsam, and Balsamito are obtained. I then believed the plant to be identical with that figured by Lambert, and which according to both Kunth and De Candolle is *M. pubescens*. A careful examination of the specimens in the British Museum, from which Lambert's figures were drawn, has led me to doubt the identity of his plant either with the Sonsonate species or with the *pubescens* of Kunth and De Candolle. For the present, therefore, I shall designate the plant which I have received, the "*Myrospermum of Sonsonate*."

The specimens of the *Myrospermum of Sonsonate*, which I have received, consist of branches, leaves, and fruits. The flowers I have not met with.



The Myrospermum of Sonsonate. [About one third the natural size.]

- A. Leaf-bearing branch.
- B. Fruit-bearing branch.
- C. Vertical section of the fruit.
- D. Lateral section of the fruit, showing the seed *in situ*.

From specimens in my possession, received from the Balsam coast by Mr. Skinner.

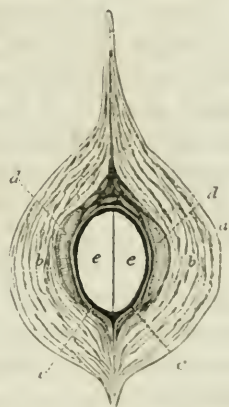
The *branches* are terete, warty, but otherwise smooth, ash-colored or ash-brown.

The *leaves* are alternate, petiolate, and impari-pinnate. The common petioles appear to the naked eye devoid of hairs, but when examined by the microscope are found to be covered with a few short hairs.

The *leaflets* are from 5 to 11, alternate, with short petioles. Exclusive of footstalk, their length varies from about 2 to 3½ inches; and their width, at their widest part, from 1 to 1½ inch.

The most usual size is 3 inches in length, and $1\frac{1}{4}$ to $1\frac{1}{6}$ inches wide. Their general shape is oblong or oval-oblong, in some cases ovate. They are rounded or very slightly tapering, not cordiform at the base. Superiorly they contract abruptly into an emarginate point. To the naked eye the partial petioles and mid-ribs appear devoid of hairs; but when examined by the microscope, short lymphatic hairs, having a glossy or resinous appearance, are distinctly visible on them; and the partial petioles appear somewhat rough from transverse rugæ. The leaflets are elegantly marked by rounded and linear pellucid spots; the lines being usually parallel with, or in the direction of, the primary veins. To see the spots, the leaflet must be held up against a strong light and examined by a magnifier.

The *fruit* is a one-celled, one-seeded, winged, indehiscent pod (called by some a samara, by others a samaroid legume.) The fruit-stalk is naked at the base, but is amply winged superiorly. The fruit, including the winged foot-stalk, varies in length, from about 2 to 4 inches; the usual length is $2\frac{1}{8}$ to $3\frac{1}{4}$ inches. At the peduncular extremity, the fruit (or rather its winged foot-stalk) is rounded, or very slightly tapering, unequal-sided; at the summit it is enlarged, tumid, and rounded, with a small point (the remains of the style) at the side. The mesocarp is fibrous; but immediately exterior to the endocarp it contains in receptacles a yellow oleo-resinous or balsamic juice, which, by age, hardens and resinifies. Ruiz, Kunth, Endlicher, and De Candolle, describe this juice as immediately surrounding the seed, and being between the seed and the lining (endocarp) of the shell: but this is a mis-



Cross section of the fruit and seed. (Magnified.)

a a Epicarp.

b b Mesocarp.

c c Endocarp.

d d Large vittæ or lacunæ containing balsam.

e e Cotyledons.

take, it is exterior to the endocarp. The principal part of the balsam resides in two receptacles or vittæ, one placed on either side; but if a transverse section of the fruit be examined by the microscope, numerous receptacles of the more or less dried balsam are perceived in all parts of the mesocarp. In the two larger recep-

tacles the balsam is usually found in the liquid state; but sometimes the walls of the receptacles are lined with the crystallized balsam (*Myroxocarpine*). That the balsam resides in the mesocarp and not in the cavity of the fruit is proved by the cross section, which shows that the paries of the cavity of the fruit is continuous with the two sutures. The seed lies loose and dry in the cell of the pericarp; and is covered by a thin, white, membranous coat, (testa?) The cotyledons are yellowish and oily, and have an agreeable odor like that of the tonka-bean or melilot, and a bitter taste somewhat resembling that of the bitter almond. By digesting the seeds in ether, a tincture is obtained, which yields on evaporation a very agreeable smelling, amber-colored, soft, extract, whose odor resembles that of the tonka-bean or melilot.

Some of the fruits which I gave to Mr. Alfred Smee were sown by him in a pot, and placed in his hot-house. Several of them have produced thriving plants. A leaf of one of the plants thus raised consists of 5 alternate leaflets marked with pellucid dots and lines. To the naked eye all parts of the leaves appear quite smooth; but when examined by the microscope the general and partial petioles, the mid-ribs, and the edges of the leaflets, are seen to be covered with small, reddish, appressed, lymphatic hairs. The lamina of the leaflet is emarginate, but the summit of the mid-rib, crowned by a small bush of hairs, projects, on the dorsal surface, beyond the lamina, and gives the appearance of a minute pointlet or mucro. As the leaflets dry this pointlet appears to be shrinking and becoming brown. As the leaf grows it probably falls off.

[The three following pages of Dr. Pereira's memoir are occupied with a comparative examination of the leaves and fruit of the *Hoitziloxtl*, or *Indian balsam tree* cf Hernandez; the *MyrospERMUM frutescens*, and *M. pedicellatum*, *M. peruiferum*, (Linn.) the *MyrospERMUM* described by Dr. Weddell, the *M. pubescens* of Kunth, *Myroxylon balsamiferum* of Pavon, and some others. As these descriptions are purely botanical, and as they are accompanied by a number of figures necessary to their full comprehension they are omitted and the scientific reader referred to the *Pharmaceutical Journal*, Vol. 10, pages 282 to 285, inclusive.—EDITOR.]

Central America is the country of the *MyrospERMUM* of Sonso-

nate. It grows on the Balsam Coast, (between 13° and 14° N. lat., and 89° and 90° W. long.,) in the State of Salvador, where the black and white balsam are exclusively obtained from it. Hernandez mentions Panuco as one the places where it grows; and Clavigero* states that it "is common in the provinces of Panuco and Chiapan."

Various medicinal products are obtained from this tree. "By making an incision in the trunk of it, a liquor exudes called the *black balsam*, an admirable remedy for effecting the speedy cure of wounds of every description: from the flowers the *spirit of balsam* is made: the seeds or nut produce the *oil of balsam*, an excellent anodyne; and the capsules yield the *white balsam*. From these simple kinds the *tincture* or *essence of balsam* is extracted; it is generally termed *balsamito*, and was a discovery of Don Jose Eustaquio de Leon, director of the mint in Guatemala who published a description of the many virtues of this peculiar medicine."†

The only medicinal products of the tree with which I am acquainted are *black balsam*, (commonly called balsam of Peru,) *white balsam* and *balsamito*.

1. *The Sonsonate or St. Salvador Black Balsam.*

This is the *Balsam of Peru*, (*Balsamum Peruvianum*, Ph. Lond.) of commerce. At Sonsonate it is termed *Black Balsam* (*Balsamo negro*.) It is sometimes denominated the *Black* or *liquid Balsam of Peru*.

Sonsonate or St. Salvador, black balsam of commerce (balsam Peru of the shops) is exclusively the produce of the Balsam Coast, which extends from the Acajutla to the Port Libertad, on the Pacific side of Central America.

It is obtained by the native Indians, who make incisions into the bark of the trees, burn the outside slightly, and insert woollen or cotton rags into the aperture to absorb the juice which exudes. When these are saturated they are removed and others introduced

**Storio Antica Del Messico*, tomo i., p. 63. 1780. (Also the English translation by Cullen, vol i. p. 32. 1788.)

†*A Statistical and Commercial History of the Kingdom of Guatemala in Spanish America*. By Don Domingo Juarros. Translated by J. Baily, Lieut. R. M. Lond. 1823, p. 261.

in their place. The rags are then boiled in water in large jars, by which the balsam is detached, and, rising to the surface, is skimmed off and put into calabashes or bladders for sale. In this state the Indians bring it into Sonsonate. The merchants who purchase let it stand in barrels that the dirty water may separate, and afterwards strain it through a sieve to separate any pieces of rags, or other foreign bodies, which may be present. Usually a little pure water is added, and the balsam is put into jars for exportation at Acajutla. Sometimes it comes direct to Europe, at other times indirectly by Lima, Valparaiso or other parts of the Pacific, or by Belize or Honduras on the Atlantic side of Central America. The average production is about 25,000 lbs. per annum.

Mr. Wazsewicz tells me that the natives obtain this balsam from three species of *Myrospermum*, which he calls *M. punctatum*, *M. pubescens*, and *M. myrtifolium*, all of which he says grow on that coast, and are not distinguished by the natives.

2. *The Sonsonate or St. Salvador White Balsam.*

This substance is called, at Sonsonate, *White Balsam* (*Balsamo blanco*.) It is, I suspect, often confounded with the balsam of Tolu, for Mr. Klée, from Guatemala, by whom my sample was sent, says that he sends the white balsam as a sample of balsam of Tolu. Its properties, however, are entirely different to those of balsam of Tolu, which Ruiz calls white balsam.

White Balsam is obtained at Sonsonate by pressure, without heat, from the interior of the fruit and seed. Mr. Wazsewicz, who, when in Central America, had assisted in procuring white balsam, described and showed me the method of preparing the fruit for the expression of the balsam. It consists in removing the wings, the epicarp, and the fibrous or woody portion of the mesocarp. All these parts are readily separated by the fingers. The nucleus of the fruit, called at Sonsonate the *pepita* or seed, consisting of the internal portion of the mesocarp, the endocarp, and the seed, is then submitted to pressure.

The expressed product, which is called white balsam, probably consists of two distinct classes of substances, viz., the *olco-resinous matter* contained in the pericarp, and the *fatty* and other constituents of the seed.

White balsam, as I received it, was imported in globular earthen jars, surrounded by a kind of wove or plaited matting, and closed by an earthenware stopper. The jar enclosed in the matting, is about a foot high (to the top of the stopper) and ten and a-half inches in diameter, and it contains about twenty pounds of balsam, which has partially concreted or crystallized on the sides of the jar.



Jar, enclosed by matting containing the white balsam.

When removed from the jar and put into a white glass bottle, it closely resembles in appearance strained American or Bordeaux turpentine. It is semifluid, or a soft solid; and by exposure becomes firmer. It is somewhat granular, apparently from intermixed resinous crystals. By standing, it partially separates into a white and more opaque crystalline resinous deposit, and a superior, more translucent, thinner, and more fluid portion. It is quite devoid of the fragrant cinnamic or vanilla odor of the balsams of Peru and Tolu. Its odor is not disagreeable, and is compounded of the peculiar smell of the balsamic matter of the pericarp, and of the melilot-like odor of the seed. One person who smelled it declared that it resembled the odor of cubebs.

It is only partially soluble in alcohol, but more so in ether. By digesting it in rectified spirit, three products are obtained: 1. A white, tough, soft solid, which remains at the bottom of the vessel. 2. An oleaginous yellow liquid which rests on the preceding; and 3, the spirituous solution which floats on No. 2. By digestion in ether, a portion of the balsam remains undissolved. The ethereal tincture, by evaporation, yields a kind of fatty or resinous product.

Balsamito.

Esencia Tincturado del Balsamo Virgen ; Essence or Tincture of Virgin Balsam.—This is a tincture of the fruit, and is made by digesting the fruit (deprived of its wings) in rum. The sample which Mr. Skinner kindly gave me, is a clear liquid, having the color of sherry wine, and the odor is like that of the melilot (*Melilotus officinalis*) or of the tonka-bean, and a very bitter taste. When mixed with water, it forms a milky liquid.

This preparation which is in high repute in Central America, was invented by Don Jose de Leon, Domiciliary Presbyter of the Archbishop of Mexico, and the director and founder of the Royal Mint of Guatemala. Its virtues (real or imaginary) are set forth at great length in a Spanish handbill (now before me) printed in Central America. An abstract of these is given in Lieut. Baily's translation of Juarros' *History of Guatemala*, before referred to. According to these authorities, balsamito is a stimulant, cordial, corroborant, anthelmintic, and diuretic. It is administered in the dose of a drachm in fainting fits, dyspepsia, flatulent colic, the cold stage of fever, hysteria, worms, &c. It is employed also to facilitate labor and the expulsion of the placenta, to check vomiting and diarrhœa, to relieve spasms, &c. In surgery it is extensively used as a vulnerary, as an application to sloughing sores, and to relieve the itching, heat, and pain which remain after the removal of a chigoe (*Pulez penetrans*.) Mixed with water it forms a milky fluid, which is used as a face-wash to remove freckles, and as a lotion for ulcers.

Mr. Skinner speaks in the highest terms of the beneficial results which he has himself witnessed from the application of *balsamito* to sloughing and other wounds, and he tells me it is in high repute in Central America as a vulnerary; a portion of this, which he kindly gave to me, I have placed in the hands of my friend and colleague, Mr. Luke, for trial in sloughing wounds. Mr. Luke tells me that he has applied it, in one case only, to a sloughing wound. It caused so much pain, that it became necessary to suspend its application. The slough, however, speedily separated.

I subjoin two extracts, one from a private letter to Mr. Skinner from his partner Mr. Klée—the other from Lieut. Baily's work on *Central America*, just published. They are in part my authorities for some of the preceding statements.

APPENDIX.

1. *Extract of a letter to G. U. Skinner, Esq., from Charles Rudolph Klée, Esq., Prussian Consul-General for Central America.*

“The tree which produces the *Balsamo negro* or *balsamo de Peru*, in this country grows only in a small district in the state of

San Salvador, near the town of Sonsonate, called "the Balsam Coast;" and although a very hot climate, it is a hilly country, but a very rich soil. It is only populated by pure Indians, who possess the secret of extracting the said balsamo de Peru, which they bring for sale to Sonsonate, put in gourds or bladders. In this way they used to ship it formerly, but the Indians bring it often mixed with rags and water; and now the merchants in Sonsonate let it stand some time in barrels and clean it, and then pack it in jars, in which package it is generally shipped now. Any other sort of oily matter does not mix with the balsam, and the dirty water gets soon to the bottom, after which it is strained; although it appears very thick it passes through a very thin sieve. Generally a little pure water is put into the jars; they say it prevents fermentation. From all the accounts that I could learn from the people in Sonsonate, and from the very Indians who sold the balsam, and which I believe to be true, it appears, that in certain seasons, they make incisions in the bark of the tree, burn the outside slightly, and then bind woollen or cotton rags round it, in which the balsam is caught up; the rags are afterwards boiled in large jars with water, and the rags fall to the ground. There is no other place on the whole Pacific side where this balsam is made, but on this Balsam Coast. All the balsamo negro which comes to the European markets, by way of Lima, Guayaquil, Valparaiso and Belize, Honduras, or Stó. Tomas de Guatemala, is the produce of our balsam coast. The whole production of it does not amount to more than 20,000 lbs. or 30,000 lbs. per year, the average may be 25,000 lbs. The merchants in Lima and Valparaiso buy it with much pleasure, and pay good prices to the Sonsonate merchants.

"The Canonigo Dhiguero, when he was proprietor of Ispanguasate, planted the balsam tree there, and I found about fifty fine large trees. The tree itself is a very fine, tall, and handsome one, with a straight, round, and high stem; the bark smooth, ashy-colored, and not very thick. The branches extend at the top, and the leaf is of a dark glossy green, rather a little curled. On a tree which was near the Campana, I tried the experiment to get the balsam out, but did not succeed; and one of the mozos told me that it was not the right time. The tree grows as high as any of your oak-trees, and as thick. In April, 1846, I purchased

two jars of *balsamo blanco* of a gentleman from Sonsonate, as a sample of *balsamo de Tolu*; these I send you as well as the kernels of which it is made. By the mode they manufacture it, it can never be made an article of trade; and unless you send us an apparatus and instruction how to extract it, which I think might be done in the way that heavy oils are extracted, such as oil of cloves, &c., provided it is worth while, no use can be made of it.

“The *Esencia tinturada del balsamo Virgen*, is what we call here *Balsamito*. Finding, by experience, that it would be a fine drug, curing old wounds, perfuming, washing, &c., &c., I got from Don Jose Soto the way to prepare it and the sample which I remit to you by the Honduras and Pacific side is pretty large, and of fine quality.*

“As I have told you already, this balsamito is made by infusing the nut of the balsam tree, macerating the shell and kernel in brandy† of thirty degrees. Its inventor was Jose de Leon, Esq., as you will see by the printed paper enclosed. However, the shell of the nut, which is like that of an almond, contains in its concavities a most aromatic oil, and more so than that of the kernel itself. Brandy can never extract all this oil. Perhaps Dr. Pereira would be kind enough to put you in the way to learn the mode how to extract the balsam, after he has seen the nut, &c.”

2. *Extract from Mr. Baily's Work, entitled "Central America; describing each of the States of Guatemala, Honduras, Salvador, Nicaragua, and Costa Rica; their Natural Features, Products, Population, and reasonable capacity for Colonization."* 8vo, 1850 Saunders, 6, Charing Cross.

“That part of the coast extending from Acajutla to Libertad, is emphatically termed the “Balsam Coast,” because there only is collected the article known in commerce as the Balsam of Peru; the particular district is intermediate to the two ports, and is not large, as it does not reach either of them within three or four leagues. Lying to the seaward of a low lateral ridge of mountains,

* It is now in the West India Docks.—J. P.

† The liquid here and in other places called “brandy,” is in fact “rum,” being obtained by fermentation from sugar.—J. P.

the whole tract, excepting a few parts on the borders of the ocean, is so much broken up by spurs and branches thrown off from the main eminence, and so thickly covered by forest as to be nearly impassable to a traveller on horseback; from this cause, it is so rarely visited, that very few residents, either of Sonsonate or Salvador, have ever entered it. Within this space are situated some five or six villages, inhabited solely by Indians, who are so jealous of their possessions, that they will not suffer any of a different race to live among them. They cultivate so little ground for maize, frixoles, plantains, and other necessities for subsistence, besides a very small quantity of cocoa, that they are not unfrequently forced to purchase these articles from adjoining parts. They have their own municipalities and chief men, governing themselves pretty much as they please, being, in fact, almost independent of every other authority. In some of the villages there is a church, but in no one a resident curate, who, when his ministry is deemed indispensable on festivals or other occasions, is attentively conveyed by them to and from Guayacoma or Ateas, to which curacies they nominally are dependant. Strictly speaking, they hold no other intercourse with other towns than what is necessary for carrying on their peculiar traffic.

“They support themselves by the produce of the balsam trees and cutting cedar timber, of which they furnish large quantities in plank and scantling to Sonsonate and San Salvador for building purposes and carpentering, with occasionally some pieces of more valuable wood, fit for cabinet work. Their chief wealth is the balsam, of which they take to market from fifteen to twenty thousand lbs. weight annually, yielding from four thousand seven hundred, to six thousand three hundred dollars. It is sold in small portions at a time in the before-mentioned towns to persons who purchase for exportation. The trees yielding this commodity are very numerous on this privileged spot, and apparently limited to it, for on other parts of the coasts, apparently identical in soil and climate, rarely an individual of the same species is here and there met with.

“The balsam is extracted by making an incision in the tree, whence it gradually exudes, and is absorbed by pieces of cotton rags, inserted for the purpose. These, when thoroughly saturated,

are replaced by others, which, as they are removed, are thrown into boiling water. The heat detaches it from the cotton, and the valuable liquor being of less gravity than the water, floats on the top, is skimmed off, and put in calabashes for sale. The wood of the tree is of close grain, handsomely veined, nearly of a mahogany color, but redder; it retains for a long time an agreeable fragrant odor, and takes a fine polish. It would be excellent for cabinet makers, but is seldom to be obtained, as the trees are never felled, until by age or accidental decay all their precious sap is exhausted. This balsam was long erroneously supposed to be a production of Southern America, for, in the early period of Spanish dominion, and by the commercial regulations then existing relative to the fruits of this coast, it was usually sent by the merchants here to Callao, and being then transmitted to Spain, it there received the name of Balsam of Peru, being deemed indigenous to that region. The real place of its origin was known only to a few mercantile men.”—(Pp. 93, 94.)

ON MYROXOCARPINE—A NEW CRYSTALLINE SUSBTANCE FROM WHITE BALSAM.

By JOHN STENHOUSE, LL. D., F. R. S.

A few months ago I received a quantity of fragrant semifluid balsam from my friend Dr. Pereira, which had been sent to him from Guatemala, under the name of *white balsam*.

This balsam is said to be obtained from the fruits of the same tree which yields the ordinary balsam of Peru.

The white balsam is quite neutral to test paper, and has a peculiar agreeable smell, pretty closely resembling that of melilot. On digesting the balsam in spirit of wine of ordinary strength, a considerable portion of it readily dissolved, and on the clear liquid remaining at rest for twelve hours, a quantity of large white crystals were gradually deposited. These crystals, which retained a good deal of adhering resinous matter, were obtained perfectly pure when they had been digested with a little animal charcoal, and repeatedly crystallized out of hot spirits. When pure the

crystals have no smell, and form broad thin prisms, rather more than an inch in length. They are colorless, and possess considerable lustre, approaching that of nitrate of silver. They are hard and brittle; insoluble in both hot and cold water, but readily dissolve in hot alcohol and ether. They are also soluble to some extent in cold alcohol and ether. When chewed they have no taste. Their solution is quite neutral to test paper. I have given this crystalline substance the name of *myroxocarpine*, in the belief that it is derived from the fruits of the *Myrospermum* as previously mentioned. It was subjected to analysis with oxide of copper in the usual way.

I. 0.2907 substance dried *in vacuo* gave 0.821 carbonic acid and 0.247 H O.

II. 0.215 substance gave 0.6085 carbonic acid and 0.185 water.

Calculated in numbers:

			I.	II.
48 C	3600	77.63	77.02	77.18
35 H	437.5	8.43	9.46	9.55
6 O	600.0	12.94	13.42	13.27
	4637.5	100.00	100.00	100.00

The empirical formula for myroxocarpine is therefore

48 C 35 H 6 O.

Myroxocarpine, when dried *in vacuo*, and then heated to 100° C., loses no weight. It melts at 115° C., and forms a transparent glass, which does not crystallize on cooling. It re-crystallizes, however, when it has been dissolved in hot spirits of wine. When myroxocarpine is heated considerably above its melting point, a very small portion of it sublimes, but by far the greater part of it undergoes decomposition, being changed into an uncrystallizable resin, with the formation of much acetic acid.

Myroxocarpine is characterized by extreme chemical indifference. It displays no affinity for either acids or alkalies, none of which at all increase its solubility. A quantity of it remained unchanged after being having boiled for several hours with a solution of potash. It is also but difficultly attacked by acids. Strong nitric acid, when assisted by heat, slowly converted it into oxalic acid, and an uncrystallizable resin, but without the formation of carbazotic, or any similar acid. Chlorine also acts upon it very slowly.

A current of chlorine gas sent for several days through a quantity of myroxocarpine in a finely divided state, and diffused through water, slowly converted it into an uncrystallizable resin, which contained variable quantities of chlorine. The chlorine, however, was retained by a very feeble affinity, for when the resin, which had been washed with water till it was quite natural, was dissolved in hot spirits, its solution, on standing for a short time, became strongly acid. Bromine produced a very similar result.

I regard myroxocarpine, therefore, as a very indifferent crystallizable resin which, in some respects, especially in the readiness with which it crystallizes, closely resembles santonine, but exhibiting much feebler chemical affinities than even that compound. The white balsam is very rich in myroxocarpine, a pound of the balsam yielding about one ounce of the principle.—*Pharmaceutical Journal*, Dec. 1, 1850.

ON THE MANUFACTURE OF COMMERCIAL ACETATE OF SODA.

By JACOB BELL, Editor of the London Pharmaceutical Journal

Manufacture of the Acetate of Soda.—The cold concentrated solution of acetate of lime* (which it is desirable should be made with distilled acid) is to be treated with a concentrated *filtered* solution of sulphate of soda, specific gravity about 1.250 temperature 98°, and agitated well by machinery, if convenient, during the precipitation of the sulphate of lime, till a little of the liquor from the decomposing vessel in which this operation is conducted will not show any precipitate on the addition of a solution of sulphate of soda in a test-tube. When this takes place, the contents of the decomposing vessel must be run on to a back, and then filtered into a cistern. Two of these backs will be required if the manufacture is conducted on a large scale, each furnished with a cistern, as it will require a good deal of washing to get all the acetate of soda from the sulphate of lime; they are to be furnished with false bottoms, and filters of stout twilled flannel. It is immaterial whether they are made square or round; the former

* See page 51 of this volume.

is most convenient where it is desirable to economise room ; each ought to communicate with *both* cisterns, so that when one back has ceased to pour strong liquor into one cistern the pipe may be stopped with a plug, and that communicating with the other cistern opened for receiving the washings of the backs. It may be ascertained when the precipitate is sufficiently washed by the taste of the liquor running away from it into the weak liquor cistern, when it is tasteless or nearly so, the sulphate of lime must be dug off with a wooden spade or shovel (iron is apt to cut the flannel), the back is then ready for another batch from the decomposing vessel. The liquor is now to be pumped from the cisterns into the iron pans, which ought to be so cast that they may offer as much heated surface as possible, and yet be not too large for a man to keep their contents in a state of brisk agitation with an iron stirrer broad and flat at the end. As it approaches dryness the temperature should not much exceed 500° , otherwise the acetate will be decomposed and converted into carbonate. Great nicety is required in this part of the manipulation, which depends entirely on the skill of the workman. When the mass is in quiet fusion, and there is no frothing up, the process is usually finished. Having thus dissipated the tar, the dry acetate may either be at once converted into acetic acid, or dissolved and crystallized ; it is more soluble in the latter condition. It is most conveniently dissolved in a large cylindrical lead vessel, heated by shooting steam into it. When the solution is completed, it may be run through a flannel filter into the top of a course of steamers, furnished with coils of three-quarter inch lead pipe. These vessels are made of four pound sheet lead cased in boards. The best size is about twenty-four feet long, four feet wide, and about nine inches deep. The pipe should be coiled from one end to the other, and go up and down about three times. Too much pipe cannot be used, as the rapidity of the evaporation depends upon the quantity employed. As the evaporation proceeds, the liquor ought to be syphoned from the top to the second, and afterwards to the third steamer, and thus make room for more bulky weakly liquor ; from the dissolving lead when a pellicle appears on its surface, it should be syphoned off into leads, and left for a couple or three days (according to the season) to crystallize. These leads need not be of heavier metal than four pounds, and made four feet long, two feet wide, and nine inches deep, but their form

must depend entirely upon the size of the crystals required. Should they be wanted larger than can be obtained in the above, the leads must be deeper, packed in sawdust, and allowed to stand a longer time. When the crystallization is complete, the mother-liquor must be taken from the crystals and emptied into the dissolving lead, and with the addition of two or three times its weight of water, used in dissolving fresh fused salt from the torrififying pans; the crystal must then be cut out of the leads, and thrown into a conical-shaped drainer and well washed. The liquor caught from the drainer must be put into the dissolving lead also. The crystals are now to be removed from the drainer to the drying-stove, where, after having been a few hours on the shelves, they should be packed in casks, and the sooner they are sold or used the better, as by keeping a loss of weight is sustained by deliquescence. The following process has been employed in the Cornbrook Works, near Manchester, under the able superintendence of Mr. A. P. Halliday:—

The rectified pyrolignous acid is saturated with lime, and the resulting solution of acetate of lime boiled down to specific gravity 1.200. This solution is now dosed with sulphate of soda, obtained from the decomposition of acetate of soda by sulphuric acid, until there is no further precipitate; sulphate of lime then falls down, and acetate of soda remains in solution. The sulphate of lime is thrown upon stone filters, twelve ft. by six ft. and washed with water until the solution comes off so weak as not to be sufficient to afford remuneration for the expense of labor, time, and fuel. The solution of acetate of soda along with the washings of the sulphate of lime, is next boiled down in iron pots, six ft. long, by three ft. deep, cold set, until its specific gravity reaches 1.300. During the evaporation, the excess of sulphate of soda is fished up in ladles, pierced full of holes, and the salt laid on drainers suspended over the pot from which it had been raised. The solution at 1.300 specific gravity, is allowed to settle over night and then drawn off to crystallize. The crystals are dissolved, in dilute pyrolignous acid, and the solution at 1.270 drawn off after settling for a fresh crystallization; the crystals are again dissolved, drawn off at specific gravity 1.500, dried and fused. The solution of fused salt is evaporated down, crystallized, and the crystals again dried and fused, and the fused salt allowed to flow out on an iron

plate, where it becomes solid, and is afterwards broken up and dissolved in water. This solution when dosed with sulphuric acid, yields pure acetic acid. Sometimes the sulphate of soda is dissolved in the crude acid, and the chalk or lime subsequently added, a portion of fuel required for evaporation is thus saved. The most economical plan, however, is that of saturating the acid liquor with sulphuret of sodium, as recommended by Turner, the only objection to its employment arising from the sulphuretted hydrogen evolved in the process, which has been known to affect individuals living upwards of two miles from the works where the process was in use. The double decomposition process above described, is by no means a satisfactory one. The sulphate of lime resulting from the decomposition carries some of the salt away with it by direct combination; it also robs us indirectly, inasmuch as we cannot wash it so as to take away all the acetate of soda, on account of the fuel required to evaporate the water used. In decomposing the acetate of lime by sulphate of soda, there is more delicacy required than workmen find convenient; the consequence is that there generally exists in the acetate of soda solution, either acetate of lime or sulphate of soda; the latter is removed by boiling out, but the former runs the crystals, as the workmen call it, that is, prevents crystallization. This happens not unfrequently. Not more than one ton of acetate of soda is usually obtained from a ton of acetate of lime, and oftentimes a much less quantity.

In some manufactories of acetate of soda, the salt is not made to undergo igneous fusion; but it is purified from all extraneous matters by repeated crystallizations and filtrations through animal charcoal, previously well washed with dilute hydrochloric acid. Care should be taken that the solution of the fused salt has not a greater specific gravity than 1.116, otherwise the carbonaceous matter with which it is mixed will not settle; the solution should then be allowed to settle for twelve hours, the clear liquor poured off, evaporated to 1.250, and put to crystallize.

Mitscherlich recommends that the solution of acetate of lime employed should be of specific gravity 1.116; and that the solution of acetate of soda be evaporated to 1.230, or 1.240, and then put aside to crystallize. Another process is that of neutralizing the acid liquor with soda-ash; this is no doubt the most convenient process, but not the most economical.—*Pharmaceutical Journal*, October 1, 1850.

MITCHAM: ITS PHYSIC GARDENERS AND MEDICINAL PLANTS.

V. HENBANE.

In the notices of the Mitcham physic gardens, by Lysons, Malcolm, and others, no mention is made of henbane. We may, therefore, infer that its cultivation at Mitcham is comparatively modern.

Two varieties of henbane (*Hyoscyamus niger*, Linn.) are cultivated by the herb-growers at Mitcham, the biennial and the annual.

Var. *a*, *biennis*. Biennial black henbane.—The plants of this variety are stronger, more fully developed and branched, more clammy, and possessing in a higher degree the downy character and peculiar odor of the plant. The leaves are deeply incised, and the flowers reticulated with deep purple veins. During the first year of its growth, the plant has no aerial stem, all the leaves being radical and stalked. In the autumn these leaves die, but the root survives the winter, and in the following spring sends up an aerial stem, which grows to the height of two, three, or four feet. The plant flowers towards the end of May, or in June.

Var. *b annua*. Annual black henbane.—This was at one time considered to be a distinct species, and was called *Hyoscyamus agrestis*. It is now admitted to be a variety only. The root is annual, the stem smaller, less branching, and less downy, the leaves less deeply incised or sinuated, less hairy and clammy. It flowers in July or August. Altogether it may be considered as a weaker and shorter-lived variety. Not unfrequently its corolla is devoid of the purple veins. This peculiarity was at one time thought to indicate a distinct species, which was named *Hyoscyamus palidus*.

Miller mentions in his *Gardener's Dictionary*, that a variety of *H. niger* was found by Professor John Martyn, near the castle at Cambridge, about the year 1729, with the corolla and anthers of a pure brimstone color, without the least tinge of purple. The seeds being sown in the botanic garden at Chelsea, produced that very same variety. But he does not say whether this was an annual or biennial sort.

Mr. Babington states that this non-reticulated sub-variety grows

wild at Esher in Surrey. On inquiring of Mr. Authur, of Mitcham, we found that this non-reticulated sub-variety was well known to him, though it is not distinguished as a different sort by the herb-growers.

No positive evidence has hitherto been adduced of the superiority of the biennial over the annual sort; but the prevailing belief is, that the more fully developed, and longer lived plant, in all probability, would more perfectly elaborate its peculiar juices, than the weaker and shorter lived sort, and on this ground, it is presumed to possess greater activity. Although the present Pharmacopœia (1836) leaves the Pharmaceutist to use either sort, the forthcoming new London Pharmacopœia, it is reported, will direct the employment of the biennial variety.

The biennial plant ought to be gathered for medicinal use during the second year of its growth, at or soon after the commencement of inflorescence. The leaves at this stage are attached to the stem which bears the flowers, and when the plant is entire, no mistake can be made, as the leaves of the first year have stalks which issue from the ground, as described by Dr. Houlton, and figured in the Pharmaceutical Journal, vol. i., p. 406 and 427. Mr. Squire has also pointed out the importance of distinguishing between the first and second year's leaves. When the stalk is removed the distinction is less easy, and the herb, as sold in the market, not unfrequently contains a mixture of the two kinds.

Although the above are the general distinctive characters, they occasionally merge into each other in individual plants, so that it is not always easy to distinguish the varieties or age, especially when the plants have been packed for travelling, and when they have been partially or entirely dried. Consequently the purpose for which the first year's leaves are chiefly used is for preparation in a dried state, in which they might, on a superficial examination, pass for the second years' leaves. Sometimes, however, so little care is taken to disguise the fact, that the long stalks betray the age of the leaves. There is a strong temptation to use the leaves in this stage of their growth, first because they yield a return which would otherwise be sacrificed; and secondly, because in brightness of color they surpass the mature leaves, and, therefore, attract those whose primary object is to please the eye. But the instructions contained in the Pharmacopœia to select the plant at the time of inflorescence, are

founded on correct principles. Mr. Moore, of Mitcham, informs us, that he never sells the first year's leaves, considering them worthless.

The annual and the biennial varieties are cultivated at Mitcham in distinct plantations. Formerly the biennial was chiefly met with and it was at one time a disputed point whether henbane was ever matured during the first year. Since this point has been decided, the annual plant has come into cultivation, and it has gradually superseded the biennial to a certain extent, as it is found more profitable to realise the return in the shorter period. The seeds are sown early in the spring ; as soon as the weather is favorable, the annual plants are thinned, if necessary, and the crop is gathered about July or August.

The biennial plants are transplanted in the spring of the second year, and the gathering of the crop commences sometimes as early as May, and generally continues throughout June, and the early part of July.

It is usual to change the ground every two or three years ; but this appears to be optional, as the plant grows wild in many places for ten or twenty years in succession, and some of the finest biennial plants are met with in the wild state. Mr. Bridger (at Mr. Moore's, Mitcham) informs us that he has seen specimens of these plants weighing as much as fourteen pounds, while the annual variety seldom exceeds three or four pounds, and the average much less.

The following report shows the variation in the product of extract arising from various circumstances. The notes were taken merely for private use, but they are quoted from the original memoranda, including the cases of failure in the result. With two exceptions the plant was furnished by the herbalist or grower, as the biennial variety in the second year of its growth. The leaves were separated from the stem, sprinkled with water and crushed, the stem being rejected.

June 13, 1844—Henbane, 3cwt. 21lbs., produce 14lbs. 9ozs.

The herb was crushed in a mill, and brought to the premises in a state of pulp. This plan was found not to answer: the delay occasioned by its transference through the different stages of the process impaired the quality, and although the produce was large it was unfit for use.

The plan of crushing the herb in a mill, although the most effectual in regard to the quantity of extract produced is liable to this disadvantage, that when the herb is too much crushed the inert fibres, are reduced to a pulp, and may in part pass through the cloth with the juice. In the following cases the plant was bruised in a marble or stone mortar with a wooden pestle:

	cwt. lb.						lb. oz.	per cwt.
1845 June 19,	1	0	-	-	-	-	produce 2 10	2 10
" July 12,	1	0	-	-	-	-	" 3 13	3 13
" " 16,	1	0	-	-	-	-	" 3 10	3 10
" " 23,	1	56	-	-	-	-	" 4 12	3 1½
1846 May 29,	2	0	-	-	-	-	" 4 10½	2 5½
" June 8,	1	39	-	-	-	-	" 4 14	3 2
" " 13,	1	0	-	-	-	-	" 2 10	2 10
" " 17,	1	0	-	-	-	-	" 2 8	2 8
" " 30,	1	5	-	-	-	-	" 2 15	2 11
" July 1,	1	7 (annual)	-	-	-	-	" 3 4	3 3½
1847 June 14,	1	40	-	-	-	-	" 3 12	2 2
" " 22,	3	0	-	-	-	-	" 6 12	2 4
" " 23,	1	56	-	-	-	-	" 4 9	3 0
" " 24,	2	0	-	-	-	-	" 3 14	1 15
1847 July 10,	2	0 (old and bad)	product not fit for use					
1848 June 2,	2	0	-	-	-	-	" 5 1	2 8½
" " 3,	2	0	-	-	-	-	" 5 8	2 12
" " 6,	2	0	-	-	-	-	" 6 12	3 6
" " 7,	2	0 (old)	-	-	-	-	" 4 14	2 7
1849 June 6,	2	56	-	-	-	-	" 5 12	2 4
" " 11,	2	0	-	-	-	-	" 5 0	2 8
" " 26,	2	0	-	-	-	-	" 6 0	3 0
" Aug. 6,	2	0 (annual plant, leaves only)	-	-	-	-	" 10 12	5 6
1850 June 21,	1	56	-	-	-	-	" 4 8	3 0
" " 25,	1	56	-	-	-	-	" 3 14	2 15½

Pharm. Journal, Nov. 1, 1850.

ON THE DISTILLATION OF MERCURY BY HIGH PRESSURE STEAM.

By M. VIOLETTE.

This new process for the distillation of mercury, consists in immersing the mass to be distilled in the current of the vapour of water heated from 350° to 400° centigrade: the vapor acts at once as the heating agent and mechanical agent; it first heats the metal so as to produce distillation, and then drives before it and draws the mercurial vapor, the reproduction of which it facilitates; it hastens the distillation, just as a hot current of air increases the evaporation

of water ; the aqueous vapors, charged with mercurial vapor, are condensed together in a common refrigeratory, the metal separates at the bottom of the receiver, while the condensed water occupies the upper part. It is curious to observe the liquid thread which flows from the refrigeratory ; two currents or threads are distinguishable, an upper one which is water, and below is the mercurial thread ; there is a continuous current of both. No concussions occur, and the operation goes on as quietly and as easily as the distillation of water.

The apparatus employed by the author in these experiments consists of,—1st, a cast iron cylindrical retort, receiving the vessel which contains the mercury ; 2ndly, an iron worm, which, being heated, the vapor of water circulates in it, and being heated to a proper degree, enters the retort, traverses it from one end to the other, the mercury being immersed in it ; it then escapes with the mercurial vapor, and both are condensed in a refrigeratory.

The author gives in a series of tables the results which he has obtained by a series of experiments relating to the distillation of mercury, both alone and amalgamated ; he states the quantity of vapor necessary, and the economical advantages of the new process which he thus details :—

1. *Facility of the operation.*—Simple ebullition and the distillation of water are substituted for the difficult and dangerous distillation of mercury ; in which there is more trouble in managing the fire, more danger of breakage of the apparatus, more difficulty in removing the metal, more wear in the retort ; whereas, in the new process, the temperature is constant and fixed, and much lower than the red heat usually employed.

2. *Economy of operation.*—One workman alone can manage an apparatus charged with 1000 kilogrammes of amalgam ; the new process is adapted to even larger dimensions.

3. *Economy of Fuel* is certain, and practice alone can state the amount of it ; no useless expenditure of fuel will occur, since the heat employed will not be greater than required for the distillation of the metal.

4. *Economy of Mercury.*—The distillation of 100 kilogrammes of silver amalgam occasions the loss of two kilogrammes of mercury. There are produced and annually distilled six millions of amalga-

mated silver; there is therefore a loss of 120,000 kilogrammes of mercury, worth at least one million of francs, which loss the new process avoids.

5. *Public Health*.—In the new process there is no loss of mercury; the mercurial vapor is condensed with the vapor of water; further, in the common operation, mercurial vapor fills the whole of the apparatus, and when it is opened at the close of the operation, the vapor is diffused in the atmosphere; whereas in the new process the vapor has driven all metallic vapor from the apparatus, and there is no danger in opening it. Thus our operation is complete, and the employment of high pressure steam seems to have effected the long sought solution of the problem, of perfectly preserving the workmen from the mortal attacks of mercury in the numerous and important uses in which this metal is distilled.—*Chem. Gaz.* Dec. 16, 1851, from *Comptes Rendus*.

ON THE PURIFICATION OF SULPHATE OF IRON OF COMMERCE TO FIT IT FOR MEDICINAL PURPOSES.

By M. THOREL, (D'AVALLON).

M. Thorel, in the *Journal de Pharmacie* for Nov., 1850, points out a mode of treating commercial sulphate of iron (copperas), so as to free it from its most usual impurities as occurring in France. He states that bi-tartate of potassa, boiled with an impure solution of proto-sulphate of iron, will precipitate the zinc as an insoluble tartrate of potassa, zinc, and iron. He further ascertained that neutral tartrate of potassa precipitates manganese from the sulphate as an insoluble tartrate. The copper is separated by boiling the solution with iron filings and a little sulphuric acid, which also brings the sulphate completely to the state of a proto-salt. The following is his formula.

Take of Copperas,	3000	parts.
Iron-filings,	90	"
Sulphuric acid,	20	"
Water,	8000	"

Put the whole in a cast iron boiler and heat to ebullition, stirring continually. Half an hour's boiling is sufficient to decompose

the sulphate of copper ; the best means of being certain of which, is to hold a bright spatula in the boiling solution a few minutes, when if any copper remains the spatula will be covered with a film. The solution is now decanted from the excess of iron-filings and evaporated to 33° Baumé. Whilst yet boiling, *six* parts of *bitartrate of potassa* in powder are added, and after a few minutes the vessel is removed from the fire, and the solution slightly acidulated with sulphuric acid. The solution is filtered into bottles, and then poured into plates, previously rinsed with a little diluted sulphuric acid, that it may crystallize. In three or four days the solution is decanted from the crystals, which are drained and dried spontaneously.

ON THE THERAPEUTICAL APPLICATION, AND ON THE PREPARATION OF HYDRIODIC ETHER.

In the Journal de Pharmacie for October, 1850, an account is given of the employment of hydriodic ether as a remedy, by way of inhalation by Dr. Huette. Fifteen to thirty grains of the hydriodic ether is transferred, by means of a graduated pipette, into a little ground stoppered bottle, (3 or 4 centimetres) an inch to an inch and a half high. The ether is covered with a stratum of water about 2 or 2½ millimetres thick, the object of which is to moderate the evaporation; when the vial is applied to one of the nostrils, and the air contained within it is drawn by an inspiration. The ethereal vapor is sufficiently diluted with air before reaching the lungs. The evaporation of the ether may be accelerated by inclining the vial to one side, so that the continuity of the watery layer may be broken; and the heat of the hand may be applied to the same object. Fifteen or twenty inspirations suffice for the impregnation of the system with iodine, and a quarter of an hour after the cessation of the inhalations, iodine is found in the urine. Nevertheless Dr. Huette has ascertained it to be present fifty or sixty hours afterwards.

Dr. Huette thus describes the physiological effects of this ether. "After some inhalations," says he, "an impression of calmness and

satisfaction announces that the hydriodic ether acts at first conformably with the sedative properties of the other ethers employed in medicine. The respiratory motions are carried on with a readiness and fulness, advantageous to the circulation; but the anti-spasmodic action of the ethereal vapor which favors the absorption of the remedy, is soon followed by the influence of the absorbed iodine. The increase of vigor ceasing to be limited to the thoracic muscles, extends to the muscular system. The appetite is developed, the secretions are increased, the genital feelings become more sensitive, the pulse acquires fulness, and the vivacity of the feelings, and the activity of the intellect, proves that the impulse given to the other organs extends to the brain also. Such are the effects that four daily inhalations of ten minutes each have produced on us. As to accident, we have never experienced any thing but a little coryza, and frequently when the vapor has been too concentrated, a slight feeling of pressure in the temples.”

M. Huette thinks there will, in many cases, be an advantage in substituting the inhalation of hydriodic ether, for the other preparations of iodine, observing that inhalation permits the fractioning of the doses to any extent, and causes the absorption of the medicine by more extended surfaces, more generally accessible in all their parts, and better calculated for the absorption of the smallest medicinal atoms, than are the digestive organs.

M. Cap in the *Journal de Pharmacie* for November, 1850, gives a note relative to the preparation of hydriodic ether.

Hydriodic ether was discovered about twenty-five years since by M. Gay-Lussac. It is formed from a mixture of one part of hydriodic acid and two parts of alcohol.

To prepare it, mix four parts of iodine with ten parts of alcohol 38°. Add little by little one part of phosphorus, and submit the whole to distillation. When the large part of the alcohol has distilled over, add three parts more, and distil to dryness. The product of the distillation is mixed with water to separate the alcohol from the ether, which last is then rectified from chloride of calcium.

Hydriodic ether has no acid reaction. Its odor is ethereal, its taste pungent, but less sharp than that of sulphuric ether. Its density is 1,9206 at 72° Fahr.; it boils at 110° Fahr. and it is not in-

flammable. When thrown on burning coals, it expands in purple vapors. It is not decomposed immediately by potassa, nor by nitric or sulphurous acids, but sulphuric acid decomposes it, and sets at liberty a part of the iodine.

The action of the air discolors it slightly by liberating a little iodine, which may be readily removed by the alkalies and mercury, a globule of which thrown into the vial, is sufficient to retain the ether in a state proper for inhalation. Its density admits of its being kept under water, in which it is insoluble; a circumstance favorable to the mode of using it suggested by Dr. Huette.

ON CITRATE OF CAFFEIN AND ITS EMPLOYMENT AS A REMEDY FOR THE IDIOPATHIC HEADACHE, CALLED MIGRAINE.

By M. HANNON.

Citrate of Caffein may be obtained by two processes, the most simple consists in infusing raw coffee, ground to powder, at the temperature of 176° Fahr. in a very weak solution of citric acid, filtering the liquid whilst yet hot, adding two thirds of its volume of ether, and agitating the mixture strongly to remove the chlorogenic acid from the watery solution. The latter is separated from the supernatant ether, and is carefully evaporated with a gentle heat. The Citrate of Caffein crystallizes in long needles, which when redissolved in distilled water and again evaporated, are obtained in beautiful long acicular white silky crystals in radiating groups.

The second process consists in making the compound by the direct union of its constituents, the caffein being dissolved in a weak solution of citric acid at the temperature of 112° Fahr. and the solution gently evaporated till the citrate crystallizes.

This salt is very soluble in water, and is assimilated much more readily than pure caffein when taken into the stomach. It consists of one equivalent of caffein, three equivalents of citric acid, and two equivalents of water.

Pills of Citrate of Caffein.

Take of Citrate of Caffein, 8 grains.

Chiendent, (*Triticum repens*) 15 “

Mix, and divide into ten pills.

USE—One pill to be given every two hours at the commencement of an attack of migraine, (or pain in the forehead,) or every hour when the suffering is acute.

Syrup of Citrate of Caffein.

Take of Citrate of Caffein,	2½ drachms.
Simple Syrup,	4 ounces.

Dissolve the salt in the syrup.

This syrup is given in tablespoonful doses every hour or two hours, according to the violence of the attack.

M. Hannon gives receipts for lozenges, ointment and clysters of citrate of caffein.—*Jour. de Pharm. Mout.* 1850.

ON THE PREPARATION OF ATROPINE.

By M. REBOURDAIN.

In a memoir published by MM. Bouchardat and Stuart Cooper in the "Annuaire de Therapeutique" for 1849, these chemists describe a process for the preparation of atropine, which yields it in a very pure state, but in extremely small quantity. They observe, that the preparation of atropine cannot be so easy as stated by the authors who have made us acquainted with this vegetable alkaloid, since we know several chemists in France who have tried to prepare it without success; that which is met with in commerce is derived from Germany.

The following process, which enables us to obtain it in a simple, quick and easy manner, may therefore prove of some service. Fresh belladonna, collected when just about to flower, after having been well pounded in a marble mortar, is submitted to pressure to extract the juice: this is then heated to 176°-194° F. in order to coagulate the albumen, and filtered. When the juice thus clarified is cold, 4 grammes of caustic potash and 30 grammes of chloroform to the quart are added to it: the whole is then agitated for a minute, and set aside. In the course of half an hour, the chloroform charged with the atropine, and having the appearance of a greenish oil, has subsided; the supernatant liquid is decanted and replaced by a little water; this is then decanted, and the washing continued until the decanted water is perfectly clear. The chloroform solution is then poured

into a small tubulated retort, and the distillation carried on in a water-bath until all the chloroform has passed into the receiver. The residue in the retort is digested with a little water acidulated with sulphuric acid, which dissolves the atropine, leaving a green resinous matter; the filtered solution is colorless. In order to obtain the atropine in a state of purity, it is merely necessary to pour the solution into a slight excess of carbonate of potash, to collect the precipitate, and to dissolve it in rectified alcohol. This solution furnishes, on spontaneous evaporation, beautiful groups of acicular crystals of atropine.

When it is impossible to obtain the fresh herb, the carefully prepared officinal extract may be used. 30 grms. of extract of belladonna, made with the purified juice of this plant, were dissolved in 100 grms. of distilled water; 2 grms. of caustic potash and 15 grms. of chloroform were added to the filtered solution. After having agitated the mixture for a minute, and then left it to settle for half an hour, the chloroform holding the atropine had subsided; it was washed with water three times after the supernatant liquid had been decanted; the chloroform solution, collected upon a watch-glass weighed 11 grms. This solution, exposed to the air, soon evaporated leaving a greenish crystalline mass, consisting almost entirely of atropine; digested with acidulated water, this mass, on being mixed with a solution of carbonate of potash, furnished a precipitate which weighed 15 centigrms. It was entirely soluble in rectified alcohol, and furnished, on spontaneous evaporation, beautiful crystals of atropine.

I believe this method may be applied to several other substances containing organic alkaloids; if not an economical method of obtaining these products, it may at least serve in many cases for determining quickly the value of certain commercial products.

In an early communication I shall describe a method for quickly ascertaining the commercial value of the Cinchonas, by acting upon a very small quantity of bark; I shall also show, that, by means of chloroform, the least traces of iodine can be detected, and shall point out the advantages which it possesses over that by starch.—*Chem. Gazette*, Dec. 2, 1850, from *Comptes Rendus*.

ON THE ESTIMATION OF IODINE IN ORGANIC SUBSTANCES BY MEANS OF CHLOROFORM.

By M. RABOURDAIN.

The detection of iodine by means of starch paste leaves nothing to be desired as regards sensitiveness; but this is no longer the case when the quantity of iodine in organic substances has to be determined. Chloroform may be advantageously placed by the side of starch as a test for traces of iodine, for by means of this reagent its presence may be detected in a liquid containing less than one hundred thousandth of its weight. If we take 10 grms. of a liquid containing one hundred thousandth of its weight of iodide of potassium, add to this liquid 2 drops of nitric acid, 15 to 20 drops of sulphuric acid and 1 gm. of chloroform, the latter after agitation acquires a very distinct violet tint.

I have endeavored to turn to account this remarkable property which chloroform possesses of removing from water the iodine which it is capable of holding in solution in the free state, and of acquiring a violet color, in order to estimate approximately the iodine in organic substances, and especially in cod-liver oil, so largely employed in medicine at the present day.

I take 50 grms. of cod liver oil, which I mix by agitation in a phial with 5 grms. of caustic potash dissolved in 15 grms. of distilled water, and heat this mixture in a large iron spoon in order to destroy the whole of the organic matter; the cinder is exhausted with distilled water, to remove the soluble portion; as little water as possible should be employed; the liquid is filtered; 10 drops of nitric acid and of concentrated sulphuric acid are added, taking care to cool the mixture; 4 grms. of chloroform are then poured into it, and the whole well shaken. After a time the chloroform is deposited, colored violet; the supernatant liquid may be decanted, and the chloroform solution be washed with water without depriving it of its color.

On the other hand, a normal liquor is prepared containing 1 centigrm. of iodide of potassium in 100 grms. of distilled water, so that 10 grms. represent, 1 milligrm. of iodine. We now take 10 grms. of this solution, 29 drops of sulphuric acid and 4 grms. of chloroform; by agitation, a colouring is obtained, which is compared with the tint furnished by the cod liver oil; in general it is necessary to add

1, 2 or 3 grms. of the normal solution, in order for the tint to be the same depth.

I have examined the three principal kinds of cod-liver oil which are found in commerce :—

1. Dark mahogany color, called brown in commerce.
2. Amber-colored, called blonde in commerce.
3. Colorless, called white or English in commerce.

Each kind was examined three times, operating, as above stated, upon 50 grms. To obtain a tint of the same depth as that furnished by 50 grms. of the brown oil, I employed 14 grms. of the normal solution, or 0.0014 of iodide of potassium, and only 12 grms. of the same solution for the two other kinds of oil. These three oils contain therefore very nearly the same proportion of iodine, which would be 1 milligram. for 50 grms., [1-70th of a grain in 1½ ounces] admitting that no loss occurs in the incineration.

I have likewise ascertained by experiment, that chloroform removes completely any free iodine from an aqueous solution. I saturated 500 grms of water with pure iodine; after having filtered the solution, I agitated it three different times with 15 grms. of chloroform; the third time the chloroform was in every instance scarcely colored.

A very small quantity of iodine colors pure chloroform a very beautiful violet, perfectly similar to the tint of the vapor of iodine; but if the chloroform is mixed with sulphuric ether, even in very small quantity, instead of the violet color, it has more the color of red wine, or even of caramel, if there be any quantity of ether present. This character may assist in detecting the sophistication of chloroform by ether.—*Chem. Gaz*, Jan. 15, 1851, from *Comptes Rendus*, Dec. 2, 1850.

REMARKS ON LINT AS USED AT THE LONDON HOSPITAL,
(Being a continuation of the paper at page 70.)

By JAMES LUKE, Esq., Surgeon, and Mr. T. H. TUSTIN.

I have examined and tested the various specimens of lint which you were kind enough to send to me, and, in compliance with your request, to state my opinion of their comparative excellence, I beg

to say that, considering the qualities which good lint should possess, of a smooth and soft surface, the flue not easily separated from the fabric, the fabric itself having closeness of texture and substance, with a capability of being torn without fraying the adjoining part, I think the specimen marked "BEST LINT, OLD KIND,"* has these qualities in the highest degree, and is that to which I should be disposed to give the preference. Some of the pieces, however, are irregular on the edge, which will induce some waste in use. From its possessing the above-mentioned qualities, it appears to me best suited for the spreading of ointment, the application of lotions, and the formation of compresses, these being the more common purposes to which lint is applied.

The specimen marked "TAYLOR'S PATENT LINT," I think is next to be preferred, and its qualities approach very closely to those of the "old kind." It has a good surface and fabric, and tears well. The edges are even, and its width convenient, and probably there would be less waste in use.

"TAYLOR'S SUPERIOR FLAX LINT" is also a good lint, and possesses sufficiency of substance and regularity of fracture. It, however, possesses the defect, in a slight degree, of the flue being too readily detached from the fabric, and on that account is not so well adapted for the spreading of ointment, as the specimens before-mentioned.

"WACKERBATH AND ROSS'S SUPERIOR GOLDEN FLAX LINT" has the same defect of flue being too readily detachable from the fabric, but in a higher degree than the preceding. It is frayed also by tearing.

"TIPTON'S PATENT LINT" has the flue still more loosely connected with the fabric, so that it is easily raised when ointment of any consistence is spread upon it. It is only four and a half inches in width; and although it tears more readily than any of the above specimens, it does so in the direction of its length, which appears to me to be inconvenient.

"TOSWILL'S PATENT LINT"† is a thready material—the threads running longitudinally, but are connected by a very few transverse filaments. It is very easily torn in the long direction, but is at

*Manufactured by Mr. Oyler, 2 York Street, Camden Town.

†On inquiry we find that this variety of lint is not now manufactured. The sample had been some years in our possession.

the same time frayed. The flue is very readily detachable from the threads, and the fabric is thin and without sufficiency of substance.

Not knowing the comparative cost of the above kinds of lint, I have of course not made cost a matter of consideration, but have endeavored to place them in the position which they should occupy, according to their respective merits as regards quality.

39, *Broad Street Buildings*, Nov. 12, 1850.

We subjoin a letter from Mr. Tustin, on the same subject, which was deferred in anticipation of the above, that both communications might appear together.

London Hospital, Oct. 17.

SIR,—Owing to the great consumption of lint and rags at this hospital, it was some time ago proposed to make a trial of the patent lint manufactured by “The National Linen Company,” to see if any improvement in the quality and saving in the cost could be effected in that article. On examination it was found that a pound of the A 2 lint, at 2s., certainly had a greater extent of surface than the same weight of the ordinary rag lint supplied to the hospital at 2s. 1d. It was found, however, that the gain was more than counter-balanced by some objections which the surgeons and assistant-surgeons made to its use. Passing over several of the minor objections, such as its being too fluffy, and its not giving sufficient support, they pronounced it inconvenient of use, inasmuch as it would not tear in any direction. The use of the old-fashion rag lint is, therefore, preferred here, which has the advantage of tearing readily in one direction, and of being strong, and giving great support in the other.

The quantity of lint and rags used here in 1849, was as follows:

	<i>lbs.</i>	<i>surface.</i>	<i>Cost.</i>
Lint . .	1140	2596 square yards	£118 15 0
Rags . .	720	4040 “	51 0 0

I am, Sir, your most obedient servant, T. H. TUSTIN.

Lond. Pharm. Journ., Dec. 1, 1850.

PARTIAL QUALITATIVE ANALYSIS OF THE TOMATO, (*LYCOPERSICON ESCULENTUM*—*SOLANUM LYCOPERSICON*).

By Jno. T. PLUMMER, M. D., of Richmond, Va.

I have long wondered why the acid of a fruit so extensively used as the tomato, should not have heretofore been determined. My earliest supposition was, that the character of the acid had been ascertained, but that the course of my reading had not brought the analysis into my view. But years have past, and I have not yet met with the slightest allusion to the quality of the acid, until to-day, in turning over the pages of the Transactions of the American Medical Association, I perceive that Dr. Porcher reports that this "fruit contains a *peculiar* acid." I have italicised the word "*peculiar*," because it implies, that whoever attempted the analysis must have failed to determine the true character of the acid; for, so far from being *peculiar* to the tomato, it is common to very many acid fruits.

It may be that the reporter did not wish to imply that a chemical examination of the acid had been made; but that, selecting his adjective rather carelessly, he merely intended to signify, that the fruit contained an acid—an agreeable acid, or an unknown acid. Be this as it may, it appears that the Association gave, on this occasion, no additional information on the subject. The fact that the hundreds of intelligent physicians, who composed the Association, allowed the statement to pass without note or comment, is presumptive evidence that the character of the tomato acid was not known to them. And if not known to them, to whom was it likely to be known?

Assuming, then, that no examination of the acid in question has been made public, I proceed to give the result of my own researches into the subject.

Every attentive person must have perceived, that the agreeable flavor of the tomato is due to the semi-transparent mass that occupies and often fills the seed cavities, and envelopes the seed. In this translucent pulp, the acid is to be found. The parenchymatous portion of the fruit does indeed contain acid enough to redden litmus, but not enough to be perceptible to the taste.

The yellow tomato was the variety upon which I operated.

1. The glair of the ripened fruit was subjected to pressure in a clean muslin cloth, and the acid juice obtained was then boiled in a Berlin evaporating dish, to coagulate the albumen present. Of this there was a considerable quantity, but it was easily separable by heat—the acid present no doubt facilitating the process.

2. The liquor was then filtered through paper, limpid and colorless. Tested with litmus paper, it proved to be strongly acid. This, indeed, was obvious to the taste.

3. This acid liquor was neutralized with ammonia. Both this alkali and potash gave to the liquor a wine-red color, which was discharged by an addition of the tomato juice, or other acid.

4. To the neutralized liquor (3) was added chloride of lime. This dissipated the wine-red color, but produced no precipitate. Ebullition in a test-tube, however, for a few moments, yielded a white precipitate. This experiment indicated the absence of oxalic, malic, tartaric and paratartaric acids, and the presence of citric acid.

5. The white precipitate (4) was soluble in chloride of ammonium. This solution boiled, again yielded a white precipitate. This reaction with sal-ammoniac afforded another evidence of the absence of paratartaric (racemic) acid.

6. The ebullition of 4 was continued until no more precipitate fell. To the decanted liquor, alcohol was added, but the liquid remained clear. This furnished additional evidence of the absence of malic acid.

7. The acid juice (2) was neutralized with lime water. No precipitate appeared. On boiling, flocculi were produced, and these were redissolved on cooling. This reaction indicates citric acid, to the exclusion of almost every other organic acid.

8. The acid juice (2) was treated with acetate of lead. A very copious, heavy, white precipitate instantly fell. This precipitate was readily soluble in citrate of ammonia; thus again denoting the presence of citric acid.

9. To the filtered, neutralized juice, was added sesqui-chloride of iron. The liquid assumed a yellowish-green color, and remained perfectly transparent. The absence of any reaction in this case excludes the idea of tannic, gallic, acetic and benzoic acids being present.

Thus, then, I determined the certain existence of *citric acid* in

the tomato, and the absence of all other acids. Other reagents were employed, besides those named; but, as they all produced corroborative evidence of the presence of citric acid, to the exclusion of others, I have not thought it necessary to add their indications to the foregoing.

It now became an interesting question, whether the acid discovered was wholly free, or in combination with a base. To resolve this problem, I added to the acid juice (2) a solution of tartaric acid in excess, and strongly agitated the mixture. † A granular precipitate was formed, characteristic of *potash*. Tartrate of lime would have redissolved in the excess of tartaric present, and would also have disappeared in sal-ammoniac solution, which did not occur with the present precipitate.

Citrate of potash, then, with excess of citric acid, is the salt which gives to the tomato its agreeable flavor.

George Dow (General History of Dichlamydeous Plants, in four ponderous volumes, London, 1831) says the esculent tomato was cultivated as early as 1596. Can it be possible, that so much time has elapsed, and this fruit has been so very generally relished in different nations, and yet no one has heretofore been prompted to examine into the cause of its palatableness?

I have some further observations to make on this plant, and especially on its medicinal properties; but they will, perhaps, be more appropriate on another occasion.

Western Lancet, Jan., 1851.

ON TRUE OIL OF ORIGANUM.

By DANIEL HANBURY.

IN a recent number of the Pharmaceutical Transactions*, I endeavored to prove that the article sold in this country as the oil of origanum is, in reality, the oil of thyme (*Thymus vulgaris*), under which latter name it is imported from the south of France. I further stated, that, so far as my observations extended, true oil of origanum was unknown in English commerce.

* Vide vol. xxii., page 367, American Journ. Pharm.

As it appeared desirable to have an authentic specimen of oil of organum for comparison, a quantity of the herb was procured and distilled with water in the ordinary way. The plant, which was chiefly collected in the neighborhood of Sheerness, was quite fresh, and very fully in flower when submitted to distillation. It afforded an exceedingly small amount of yellow oil, seventy pounds producing scarcely an ounce. This small produce may in part be attributed to the coolness and humidity of the weather for some time before the plant was collected, as it is evident from the following passage in Brande's *Dictionary of Materia Medica*, that a much larger amount of oil is usually obtained. This author states, "the average produce of essential oil from this herb [organum] is one pound from two hundred weight; but it varies exceedingly with the season and culture of the plant."

Contrasted with oil of thyme, oil of organum is distinguished by the following characters:—

1. Odor, which is somewhat analogous to that of oil of peppermint, and entirely dissimilar from that of oil of thyme.

2. Color, which in oil of organum is bright yellow, while the ordinary kind of oil of thyme is of a more or less deep reddish-brown.

The specific gravity of the two oils is so nearly alike, as to afford no distinctive criterion. That of oil of organum is .8854, of oil of thyme (average of three samples) .8934, at 62° Fahr.—*Lond. Pharm. Journ.*, Jan., 1851.

REMARKS UPON THE CINCHONA PITAYA OR PITAYA BARK.

BY B. W. BULL.

Some years since, a sample of bark came under the observation of the writer, which corresponds in its physical characteristics with the description of a bark under the head of False Cinchonas, in the United States Dispensatory under the above name.

Dr. Pereira, in his *Materia Medica*, and Guibourt, mention the same bark under slightly different names, and all agree in attributing to it the so-called alkaloid Pitaya, said to have been dis-

covered by two Italian chemists, Folchi and Peretti. The parcel alluded to was purchased by a drug-house in Boston, eight or ten years since, from the mate of a whaling vessel; no information was obtained by them respecting the locality in South America, whence it was procured; but it may be inferred that it came from the Northwest Coast, since ports in that region are said to be the only ones which the whalers frequent.

It is apparently taken from the younger branches of the tree, is closely quilled, the quills are about twenty-four inches in length; in diameter, from three-eighths to one inch, and about an eighth-inch in thickness; it is compact, and destitute of the fibrous structure observable in the true *Cinchona*s.

The color of the outer surface is a dull brown, interspersed with irregular patches, which are of a lighter tint than the surrounding portions; in some specimens possessing a citron or yellowish brown, and in others a gray color. These spots vary in length from one-quarter of an inch to six inches; and in breadth, from a quarter inch to the whole surface of the quill. Those of the citron color seem to be slightly depressed, as if a part of the exterior coat had been removed, but a close examination shows this not to be the case. The gray spots are not as sharply defined, and appear to be caused by the presence of cryptogamous plants. The inner surface varies from a light to a dark brown, and is in some specimens nearly black. The transverse fracture is irregular, has a deep orange color, and a disagreeable permanently bitter taste, very different from the aromatic bitter of the true *Cinchona*.

At that time I instituted a series of experiments, with a view of isolating this alkaloid, as well as for the purpose of ascertaining as far as possible the other constituents. I was entirely unsuccessful in detecting any alkaline principle, and the result of my observations were, that, beside ligneous fibre, its principle constituents are, resin, gum in small proportion, a sweetish substance, red coloring matter, a green coloring substance soluble in ether; a volatile principle to which the odor of the bark is due, and inorganic lime salts, consisting mainly of chloride and sulphate, to which may be added a bitter principle, soluble in water and alcohol, which may be classed with the long list of analogous substances under the head of bitter extractive.

It is unnecessary to go into detail in relation to the processes used to arrive at the above results ; but it may be added, that this bark subjected to treatment with aqueous or alcoholic menstrea, manifests properties widely differing from those of the officinal Cinchonas under similar circumstances.

The above-mentioned extractive matter resembled very much in its tenacious property, as well as in taste, the extract of Gentian, while several different processes were unsuccessful in enabling me to separate from it any crystallizable principle.

A specimen of this bark was shown by me to Professor Guibourt at the Ecole de Pharmacie in Paris, which he pronounced at once to be the variety from which the above-mentioned alkaloid was said to have been obtained, but that its discovery by Folchi and Peretti was a *betise*. Professor G. seemed to be of the opinion that this bark contained either quinia or cinchonia, though I did not understand that he had investigated it himself. Since that time I have re-examined a portion of this same bark at the laboratory in Giessen, and am quite confident that it contains no alkaline principle whatever, and its tonic properties, if it possesses any, must be traced to other sources, than to the presence of the principles which have hitherto been attributed to it.—*N. Y. Reg. of Med. and Phar.* Feb. 15, 1850.

ON EXTRACT OF HEMLOCK.

BY MR. W. ARCHER.

In the following experiments upon the expressed juice and dried leaves of the hemlock plant (*Conium maculatum*) made in the laboratory of the Pharmaceutical Society, the results sought were,

1st. The means by which the expressed juice of the plant could be inspissated, so as to form a mass most nearly resembling, in chemical and medicinal properties, the freshly expressed juice.

2nd. Whether, by the separation of some of the constituents of the recently expressed juice, a more efficient extract than that usually met with could be obtained.

3rd. Whether proof spirit, or rectified spirit, was the best menstruum for hemlock leaves.

The evaporating processes, whose comparative merits were tested, were, 1st. Exposure in shallow vessels to the open air in warm dry weather.

2nd. Exposure in shallow vessels to the influence of a *continuous current* of warm dry air. (In this instance an apparatus was employed precisely similar to that recommended in Mohr and Redwood's *Practical Pharmacy*, p. 78, fig. 72.)

3rd. Exposure to the heat of an ordinary water-bath.

The result obtained by the first process is very satisfactory, so far as regards the quality and appearance of the extract obtained; but there is a great obstacle to the adoption of this process, especially on a large scale, viz: the uncertainty of the weather. It appears probable that no more efficient and generally applicable means of effecting the inspissation of hemlock juice, and other analogous fluids, will be met with, than is afforded by the application of the *principle* of the hot-air closet before mentioned.

In the use of such an apparatus we have the following advantages:—

The evaporating liquid requires no stirring or other attention from the commencement until the conclusion of the process.

The temperature of the closet is perfectly at command, within a certain range; the evaporating liquid maintaining a temperature about 40° F. below the temperature of the air passing over it. For instance, we can easily obtain a current of air at 140° F. in the upper part of the apparatus, while the temperature of the liquid placed there does not exceed 100° F. The rate of evaporation is quicker than might have been expected, though perhaps not so expeditious as many would deem desirable; still it was found that the evaporation might be greatly accelerated if means were provided for forcing the current of heated air more quickly over the surface of the liquid by the use of a blowing apparatus, similar in construction to those employed at iron-foundries and smelting houses.

Evaporation by means of a water-bath is too well known to need any remark.

It was thought likely that the chlorophylle and albumen contained in the juice of hemlock might be removed with advantage, in

the preparation of the extract, as these substances are generally believed to be inert.

When the expressed juice was heated to 110° Fahr., and allowed to cool, the whole of the chlorophylle subsided, while the albumen remained in the supernatant liquid in an uncoagulated state; for the purpose of obtaining these two apart from each other, the liquid containing the albumen was filtered from the chlorophylle, heated to 212° F. in order to separate the latter, and again filtered. This second filtrate was evaporated in the hot air apparatus before mentioned, the product was an extract of a brown color, *perfectly* soluble in cold water; from the aqueous solution of this extract, alcohol precipitated a large amount of mucilaginous matter.

By washing with cold water, the peculiar odor of hemlock-juice could be entirely removed from both the chlorophylle and albumen, and as no smell of conia was evident on rubbing either of them with solution of potash, it would appear that the general opinion regarding the inertness of these two substances is correct. Caustic potash appears to be a very delicate test for conia; if any substance containing merely a trace of this alkaloid, be rubbed with liquor potassæ P. L., its presence is at once manifested by the development of its peculiar odor.

Some experiments were made with the view of ascertaining how far the official tinctures of hemlock might be regarded as uniform and efficient preparations.

Different specimens of hemlock leaves lost by drying from sixty-five to eighty per cent; it is evident, therefore, that equal weights of fresh leaves, obtained under different circumstances, will give very unequal results in the strength of preparations made according to formulæ in which a given weight of fresh leaves is ordered. Neither can the expressed juice be used with advantage where a given quantity is ordered, as its density varies considerably, depending in great measure on the state of dryness of the plant.

It would appear then, that by the use of dried leaves this source of error may be avoided, and the uniformity of the preparation sufficiently secured, especially as these can be obtained in a pretty equable state of dryness, and with a very slight deterioration of their physical and chemical properties by the use of the hot-air apparatus before alluded to.

The experiments made seem to indicate that rectified spirits (sp. gr. .838 at 62° Fah.) is a more eligible menstruum for hemlock leaves than proof spirit (sp. gr. .920 at 62° Fah.), inasmuch as the mucilaginous and albuminous constituents of the leaves are quite insoluble in the stronger spirit, while conia, in the state in which it exists in the dried leaves, is perfectly soluble in it.

A portion of hemlock leaves, dried in the manner mentioned, was percolated with spirit (sp. gr. .838 at 62° Fah.) until the liquid passed colorless. On treating the residue with water, and evaporating the liquid, an extract was obtained, which gave no smell of conia when rubbed with potash, and had the characteristics of an inert mucilage. A portion of the tincture obtained as above was allowed to evaporate spontaneously, the residue was very small in proportion to the quantity of the tincture employed, and could scarcely be said to possess the characters of an extract, inasmuch as it consisted of a yellow oily-looking semi-fluid substance of very disagreeable odor, mixed with a small quantity of chlorophylle. Another portion of the same tincture was distilled with a strong aqueous solution of potash; the distillate, which evolved the odor of conia strongly, was mixed with a little water and left at rest; after a few hours, a thin oily-looking film, having an alkaline reaction, appeared on the surface.

It has been before mentioned that the object of these experiments was to ascertain the best means of preparing the Pharmacopœia extract of hemlock, the means by which the *most efficient* extract could be obtained, and whether proof spirit or rectified spirit was the best menstruum for hemlock leaves.

It is thought that the following answers may be deduced from the account of the experiments made—

1st. That the best means of inspissating hemlock juice is to subject it, placed in shallow vessels, to the influence of a continuous current of warm dry air.

2nd. That an extract, possessing greater activity in equal doses than that generally met with in commerce, may be obtained by removing the albumen and chlorophylle from the expressed juice before evaporating it. Were this mode adopted, there would not be

the same inducement as there now is to give a factitious green color to extract of hemlock.*

3rd. That as dried hemlock leaves were, to all appearance, deprived of their activity by rectified spirit, and that as the resulting tincture held few of the constituents of the dried leaves in solution, besides conia, and a little chlorophylle, a strong spirit of specific gravity .838, or thereabout, is better adapted for making an effective tincture of hemlock than a weaker spirit is.

As regards the part of the plant to be used, it will, it is thought, be found more advantageous to use the leaves alone than any other part, the expressed juice from the leaves containing a less amount of water, in proportion to the amount of solid matter, than an equal weight of juice expressed from any other part of the plant.

The color of the expressed juice is also much influenced by the part of the plant used, that from the leaves being of a much brighter green than the juice from any other part of the plant.

[*This is corroborative of the views given at pages 207 and 382 of vol. xxii of this Journal, in speaking of the extract of hemlock prepared by the Messrs. Tilden & Co. The new formula in our Pharmacopœia of 1850, just published, directs this extract to be made in the manner described.—

We have recently had an opportunity for comparing the therapeutical power of the Extract of Conia, prepared by Tilden & Co. with the English extract obtained from one of the best importing houses in this city. The latter was introduced into a prescription and used in two grain doses. The physician was meanwhile informed of the brown *vacuum* extract of T. & Co. and directed us to use it when the prescription was renewed. Soon after the patient had commenced taking the latter extract, the peculiar narcotic action of the drug was so much more apparent, that the physician was sent for relative thereto.

We dissolved two hundred grains of this extract of hemlock in water, precipitated with subacetate of lead, filtered, and washed the precipitate well. The solution thus obtained, was mixed with caustic potassa, and shaken with chloroform, as recommended by Rabourdain for Atropia, (see page 159.) The chloroform solution was suffered to evaporate spontaneously, and yielded nearly *one grain* of a brownish semi-fluid, having a strong mouse-like odor, and alkaline reaction. The ascertained activity of this extract, viewed in connection with the small yield of impure conia, is an evidence of the potent character of this alkaloid. Geiger obtained but 1-12800th from the fresh leaves, by distillation with water.—*Editor Am. Journ. Pharm.*]

Varieties.

Cotton Seed, (Gossypium herbaceum) as an antiperiodic.—Dr. FROST, (in the *Charleston Journal*, May 1850,) recommends a strong decoction of cotton seed as a remedy for intermittent fever, and says that its use originated with a planter in Newberry District, in cases of that disease among his negroes. Dr. W. K. Davis, of Monticello, S. C., says, "I have never failed to cure a patient with a single dose of it, even where large doses of quinine have failed. Where the patient has been ill of third-day fever and ague for months, in such cases success has followed its use."

The mode of using the remedy is thus described:—After having given a dose of calomel the day or night previous to the attack, followed by castor oil in time to produce a cathartic effect before administering the tea, you put a pint of cotton seed with a quart of water in a vessel, and boil it until half the water has evaporated. Put the patient in bed an hour or two before the usual recurrence of the ague, and give him a gill of the warm tea to drink.

[If this remedy should prove to be as valuable as the above paper suggests, cotton seed should be examined for their active principle.—EDITOR.]

On the employment of Oxygen in accidents from chloroform.—M. DUROY, Pharmacist of Paris, has sent to the Academy a memoir, wherein, after having sought to demonstrate by experiments that pure oxygen can be respired without danger, and that for many hours together, and that that gas respired with chloroform vapor, attenuates its effects and opposes its influence, he thinks that it will be good to always respire pure oxygen after inhalations of chloroform, that by this means we can have all its benefits as an anesthetic agent without its inconveniences. The enervation, pain in the head, inflammatory reaction, and all the secondary symptoms of greater or less importance, and of long or brief duration, which always occur after the use of chloroform, disappear immediately after the operation when oxygen is associated.

It follows also, from the facts collected by the author, that oxygen can be considered as an antidote to all cases of asphyxia from charcoal and other gases and deleterious vapors.—*Journal de Pharmacie*, July 1850.

Improved specific gravity bottle.—Mr. JOHN ABRAHAM of Liverpool, Eng., has lately constructed, (*Pharm. Jour.* p. 125, Sept. 1850,) specific gravity bottle with a new arrangement of the stopper, the proposed advantage of which

is to avoid the inconveniences arising from the expansion of fluids, when the temperature of the air is considerably above that of the fluid experimented with.

An ordinary thousand grain flask is fitted with a stopper having a conical cavity through its centre, the inferior end being smallest, (large stopper.) A second stopper, longer than the first passes down through the conical cavity, and closes its smallest end accurately, (long stopper.) A third short stopper is provided which fits the superior end of the conical cavity, loosely, when the long stopper is removed. (Small stopper.)

The instrument is used thus:—Fill the flask with fluid at the required temperature, slightly grease the long stopper and insert it carefully into the cavity of the large stopper, so as to close it perfectly, then insert the stopper thus arranged, into the flask, permitting the excess of fluid to run over the side. The large stopper is now removed, and the small stopper inserted in its place; after which the bottle is deliberately and carefully wiped and weighed; as there is plenty of space in the cavity of the large stopper to accommodate the expansion of the fluid, no loss is occasioned by overflow or evaporation. The counter-balance weight may include the long stopper or not as the maker chooses.

Aridium, a probably new metal. By M. ULLGREN.—Wallmark recently communicated to the Academy of Sciences of Stockholm, a paper by M. Ullgren, in which he describes a metal, probably new, which occurs in the chrome iron of Rösos, and in some other iron ores, which for the present, is called *aridium*, from its resemblance to iron in its oxides.

It dissolves in muriatic acid without disengaging chlorine, and yields on evaporation a deliquescent lemon yellow uncrystallized residue.

A solution of per oxide of aridium does not become black when mixed with an infusion of galls, but intensely indigo blue, and on the addition of acetate of soda, a brownish violet precipitate is formed.

Sulphocyanide of potassium, colors a solution of per oxide of aridium, deep red like iron, but is not discolored by an access of acid. The alkaline sulphurets precipitate it blackish green.

Many other reactions of this supposed new metal, showing its difference from iron and cerium, will be found in the *Pharm Journal*, Sept. 1850.

Leaves of the Bofareira (Ricinus communis) as a Galactagogue.—Dr. J. O. McWILLIAM, whilst engaged in an official investigation into the nature and history of the yellow fever epidemic in the Island of Bona Vista, in the Cape de Verdes, in 1846, had his attention attracted to a remedy commonly had recourse to there, to accelerate and increase the flow of milk from the breasts of child-bearing women. This remedy proved to be the leaves of the common castor oil plant, and also those of the *Jatropha curcas*, belonging to the same natural family.

The remedy is applied in the form of decoction as a bath to the breasts

for fifteen or twenty minutes, and then a part of the decocted leaves are applied over the organs and kept there until they have become dry by the evaporation of the mixture. These operations are then repeated until the flow of milk is established, which usually occurs in the course of a few hours.—*Charleston Med. Journal*, Jan. 1851.

On the removal of Sulphuretted Hydrogen from solutions. By H. ROSE.—When we have to determine the chlorine in metallic solutions, from which the metals are first to be precipitated by sulphuretted hydrogen, the latter must be expelled before the precipitation with a solution of silver can be undertaken. Heat is not practicable for this purpose, as the chlorine might easily be lost by it. In such cases, Rose added sulphate or nitrate of copper. But here also a loss of chlorine takes place, since the precipitated sulphuret of copper takes up chloride of copper. This can, however, be avoided, by adding sulphate of iron to decompose the sulphuretted hydrogen, because then the sulphur only is precipitated; for this, after being washed, contains no chlorine. The chlorine is subsequently precipitated by a solution of silver.—*Pharm. Journ. and Trans.* July, 1850, from *Poggendorff's Annalen*, and *Pharm. Central Blatt*, April, 1850; No. 17, p. 271.

Oxide of Zinc. By M. SOREL.—Some communications having been received at previous sittings of the Academy, containing observations tending to cast a doubt on the freedom from injurious consequences resulting from the employment of the oxide of zinc, M. Sorel stated, that the experience of fifteen years has demonstrated to him that the health of the workmen employed in working zinc or its oxides, is not at all affected from this cause. "During fifteen years," says M. Sorel, "we have employed in our galvanization of iron establishments, several hundreds of workmen, a great number of whom have been for a long time occupied with powdering and sifting the grey or suboxide of zinc, with which we make our galvanic paint, and never have any of these workmen, who are often in the midst of a cloud of oxide, been ill, or complained from this cause. I would also affirm, that the white oxide is equally as innocuous as the grey oxide. We have manufactured the oxide of zinc on a large scale for several months, and although the workmen have often respired considerable quantities of oxide, they have not suffered the slightest indisposition therefrom.—*Ibid.*

Improvement in making Magnets.—Professor FARADAY has recently exhibited at the Royal Institution, a magnet of great power, made by a new process. A magnet of the same description has also been submitted to the Academy of Sciences at Paris. These magnets are made by M. Logeman, optician, at Haarlem. The method adopted in their construction has not been made public, but it is said to be founded on the researches of M. Elias, of Haarlem. The force of these magnets is double that of magnets made in the usual way. The one exhibited at Paris weighed one pound avoirdupois, and was capable of supporting $27\frac{1}{2}$ lbs. On placing a piece of letter-paper

between the poles and the keeper it still supported a weight equal to that borne by the best magnets hitherto made—*Ibid.*

On a mode of distinguishing Paper made from Linen and Cotton. By M. CESARECA.—M. Cesareca of Havanna, states, in this communication, that the employment of caustic potash or soda is the best mode of ascertaining whether linen or cotton has been employed in the manufacture of any kind of paper and recommends the use of the following process as a means of readily ascertaining the difference:—Boil the paper in a mixture of two ounces of caustic soda or potash, in a quarter of a pint of distilled water; the paper made with linen remains unacted upon, whilst that made of cotton is reduced to a pulpy mass. This alkaline liquor also furnishes a means of distinguishing cotton and linen fabricks, and their admixtures.—*Ibid.*

Protection of Electrifying Machines from Dampness.—To protect electrifying machines from dampness, Münch recommends us to draw from the centre of both of the surfaces of the glass-disk towards the periphery, a line with grease, and by which the disk on being turned, becomes covered with a thin coating of fat, and is thus protected against contact with damp air. The insulating glass feet of the machine may also be thus protected by drawing on them a line with grease, and spreading it with a cloth. The machines can then be worked even in damp weather.—*Pharm. Central Blatt*, 1850. No. 12.—[The same effect is obtained by covering the glass surface with a film of some volatile oil, as oil of cloves.—*Ed. Pharmaceutical Journal.*]—*Ibid.*

Marbling Materials.—Four parts of resin and one part of wax having been previously melted together, six parts of a hot solution of glue are added, and after this four parts of powdered alum, with twelve parts of powdered gypsum. Color the composition to pleasure, stir in a quantity of refuse silk [*Seidenabfülle*] and pour in moulds. The surface assumes then a veiny appearance. The walls of rooms may thus be decorated, if the cement be mixed with the refuse of silk instead of with cow-hair—*Ibid*, from *Pharm. Central Blatt*, 1850, No. 12.

Telegraphs in Germany.—Within the last four months, through the activity of the minister of trade, no less than 1000 miles of telegraph have been opened in Austria, making the total mileage about 2000, of which about one-quarter has the wires laid underground on the improved system. Another 1000 miles will be ready by next year. The telegraph now works from Cracow to Trieste, 700 miles. On the 1st October the new telegraph union between Austria, Prussia, Saxony, and Bavaria comes into operation under a uniform tariff, which is one half the former charges. The progress will be looked upon with interest by the commercial public here, who are very

much in want of facilities corresponding to those enjoyed in the United States and at the same charges.—*Journal of Franklin Institute*, Jan. 1850, from *London Mining Journal*, No. 787.

Chloroform and Ether.—Dr. MARSHALL HALL stated to the Medico-Chirurgical Society, Dec. 10, 1850, that he divided the effects of chloroform into three stages: in the first of which voluntary motion is diminished; the second, in which respiration fails; the third, in which circulation fails:—and from the quickness of its fatality in experiments on animals, considered it a most fearful poison. He feared many of its fatal results in private practice had not been made known, and considered, if its influence is carried beyond its effects on the cerebrum, its application was certainly dangerous. In cases of asphyxia there are more efforts of expiration than of inspiration. He thought it was ill-judged to have changed from ether to chloroform, as the former is less dangerous, and as capable of producing anesthesia.—*Med. News*, March, 1850. from *Lon. Med. Gaz.*, Dec. 1840.

Cypripedium pubescens, *spectabile* and *humile*. Ladies' slipper. Moccason plant. By Dr. E. IVES.—The *pubescens* is called the yellow spider plant. To me they appear identical in their effect on the constitution. I consider the *pubescens* the most powerful. I have used the three species in a variety of nervous diseases, and have known them to remove epilepsy. A hypochondriacal patient, who could not sleep, and was not benefitted by any preparation of opium, never failed of sound rest after taking twelve grains of the powdered root of the *Cypripedium pubescens*. In certain neuralgic affections, with morbid sensibility of the whole nervous system, it has produced a beneficial effect. A lady, from close application to very delicate painting, became so much effected in her eyes that she could not fix them on any object without excruciating pain. The whole nervous system was at the same time morbidly sensitive. She took the various narcotics, as strychnos, stramonium and hyoseyamus, without any material benefit, but was very much relieved by taking fifteen grains of this *cypripedium* three times a-day. The remedy was continued for months. The health of this patient was restored after a period of two years by the use of this remedy and a voyage across the Atlantic.—*N. Y. Reg. of Med. and Pharm.*, from *Trans. Amer. Med. Association*.

Comparative Examination of English and Russian Rhubarb. By Dr. MICHAELIS.—Dr. Michaelis, of Hohnstein, has made a comparative examination of English and Russian rhubarb, with respect to the proportion of rhein, bitter and astringent extractive, resin, oxalate of lime, and woody fibre contained in them. He first determined the sp. gr. of six pieces of each kind.

Russian (half and wholly trimmed

pieces) 0.918 0.893 0.891 0.857 0.798 0.743

English	0.826	0.801	0.787	0.739	0.694	0.617
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One very spongy piece had a sp. gr. of only 0.511. In general, therefore, English rhubarb has a less sp. gr. than the Russian. The greater sp. gr. of the latter sort depends upon the larger proportion of oxalate of lime which it contains. The following table represents the results of the author's analysis of the two sorts:—

	<i>Russian Rhubarb.</i>			<i>English Rhubarb.</i>		
Sp. gr. . . .	0.918	0.857	0.743	0.826	0.739	0.617
Rhein . . .	4.3	3.8	3.2	5.3	4.9	3.1
Resin . . .	10.3	8.5	8.1	4.7	5.8	4.6
Oxalate of lime .	15.2	11.7	11.4	10.3	8.7	3.1
Extractive . .	14.7	13.5	22.6	32.3	39.5	26.9
Woody fibre .	14.0	16.4	21.9	23.8	31.2	43.3

In English rhubarb the proportion of resin is smallest, of extractive the largest. In the Russian sort the proportion of oxalate of lime is considerably greater. In the English sort the rhein and woody fibre preponderate. According to the author, the purgative quality of rhubarb depends on the resin and oxalate of lime, and the tonic properties on the rhein and extractive matter; hence Russian rhubarb is more purgative than the English, while the English is more tonic than the Russian—*Pharm. Jour. and Trans.* July 1, 1850, from *Arch. d. Pharm.* 2 R., bd. cix., s. 165—167.

Neutral Citrate of Soda, a new Purgative suitable as a substitute for Saline Mineral Waters, the Citrate of Magnesia, Sulphate of Soda, of Potash, of Magnesia, &c.—M. GUICHON, a pharmacist of Lyons, has suggested the use of the neutral citrate of soda as a substitute for the citrate of magnesia and as being but half as costly.

This salt is white, without odor, often very slightly acid; it effloresces slightly on exposure to the air; it crystallizes in six-sided pyramids; its chemical formula is $\text{NaO}, \text{C}_4\text{H}_4\text{O}^1$.—[More probable, $2\text{NaO}, \text{HO}, + \text{C}_{12}\text{H}_5\text{O}_{11}, + \text{HO}?$ The formula stated in the text is evidently incorrect.—ED. AM. JOURN. PHARM.]

Acid	49
Oxide of sodium	26
Water	25

100

It is easily preserved; an excess of acid diminishes very decidedly its purgative powers. Dr. Patton, chief physician to the hospital of Antiquaille of Lyons, has experimented with it both in the state of a neutral salt simply dissolved in water, or in a demulcent drink, and in the state of a neutral salt very slightly acidulated and sweetened. Young subjects are purged by it in the dose of 40 grammes, and adults in the dose of 55 grammes. These experiments, which have been repeated by many physicians of

Lyons, show that this new purgative possesses equal powers with the citrate of magnesia, and is much less costly.—*Amer. Jour. of Med. Sciences*, Jan. 1851, from *Revue Medicale de Paris*, 31st May, 1850.

New Antiperiodics.—The French medical world has been lately on the *qui vive*, on the subject of antiperiodics, stimulated by a prize of 4,000 francs, offered by the Society of Pharmacy, for the discovery of a substitute for Quinine, and to which the French Minister of war has offered to add an equal sum. M. Delioux, Professor of Materia Medica, at Rochefort, maintains that CHLOROFORM is a powerful succedaneum for cinchona and arsenic. A sufficient number of cases of periodic fevers, which are very common at Rochefort, were treated at the hospital there, with chloroform, and with such a regularity of success, that M. Delioux feels warranted in recommending it as a powerful antiperiodic. The chloroform was given in doses of from nine to thirty grains, according to the severity of the case. The patients took it several times before the access, and continued its use for several days. To make a good mixture, the chloroform is to be first rubbed up with syrup, and then it mixes readily with water.—*Jour. de Med. et Chirur. Prat.*, July, 1850.

The *Physalis Alkekengi*, or winter-cherry of France, is also proposed as a remedy for intermittents. The whole plant, twigs, leaves, capsules and berries, are described as possessing the anti-periodic qualities of cinchona. *Med. Examiner*, January, 1850, from *Gaz. Méd.*, July, 1850.

Poisoning with Dulcamara. By Dr. PLAETSCHKE.—A man 40 years of age, who was using decoction of dulcamara-stalks for a cough, took, one forenoon, from three to four quarts prepared from a peck of the stalks. In the evening he was suddenly seized with numbness in his limbs, and pains in the knees and elbows, dryness of the throat and paralysis of the tongue. These symptoms increased so much in the course of three or four hours, that he could scarcely move either his limbs or tongue. The head remained unaffected, consciousness unimpaired, the pulse quiet, but small and rather hard, breathing regular, the skin cool; there was neither nausea nor vomiting. From the time which had elapsed since taking the decoction, the administration of emetics was contraindicated; recourse was therefore had to stimulants. Camphor was given freely, and the symptoms gradually disappeared.—*London Med. Gaz. from Casper's Wochenschrift*.

Falsification of Cantharides.—M. EMANUEL, pharmacist at Isbernheim having received cantharides from a very reputable house, discovered that they were admixed with about 16 per cent. of another coleopterous insect of a brilliant green color, the *Crysmela fastuosa*, that is found in abundance on the *Galeopsis ochroleuca*, the *Rubus idæus*, the *Urtica*, the *Lamium*, etc. This falsification is evidently owing to design and not to a mistake, because

the two insects present to the view such different characters, that it will be impossible to confound them involuntarily.—*Journal de Pharm.* Nov. 1850.

Note on Yerba Maté or Paraguay Tea. By M. LENOBLE, of Montevideo.—According to M. D'Orbigny, the Paraguay tea is derived from the *Psoralea glandulosa*, the leaves being slightly heated, and afterwards pulverized.—[Paraguay tea is usually ascribed to the *Ilex Paraguayensis*.—Ed. *Amer. Jour. Pharm.*]

The *Psoralea glandulosa* is a tree as large as a medium sized apple-tree, its bark is whitish and shining, its flowers are poly-petalous, disposed in clusters, its seed have a violet-red color and resemble grains of pepper, whilst the leaf bears much resemblance to that of the orange.

The infusion of *yerber maté* has much analogy with that of tea, and possesses an aromatic odor, bitter astringent taste, and is stomachic and stimulant.

M. Lenoble, by treatment with ether, alcohol and water, has obtained from these leaves, 1st, tannic acid; 2d, chlorophylle; 3d, vegetable wax; 4th, albumen; 5th, volatile oil; 6th, gummy extractive; 7th, a substance which crystallizes in fasciculated needles, to which he has given the name of *psoralein*.

Psoralein is obtained by making an infusion by displacement with cold water, heating it to ebullition, to coagulate the albumen and filtering. The clear infusion is then evaporated to dryness, the extract treated with distilled water and the solution boiled with a little magnesia. The liquid, after having been filtered, was evaporated to the consistence of an extract, and treated with sulphuric ether, which dissolved a bitter principle, and by evaporation yielded a whitish substance crystallized in fasciculated needles, which was soluble in water, alcohol and ether, was not precipitated by sesquisulphate of iron, and which yielded ammonia when decomposed at a high temperature.—*Jour. de Pharm.* Sept. 1850.

Collodion applied to Burns.—Dr. LIMAN, of Berlin, states that he has found collodion a most excellent application to burns. He has applied it in many cases with the best results. He states that it allays the smarting, forms a protective covering, which excludes the action of the air, and is so exactly adapted to all parts, that no other dressing is required. The first application is attended with some pain, but is soon followed by alleviation of the suffering, and the cure proceeds steadily without pain. Dr. Liman applied the collodion with a camel-hair pencil, covering the entire surface, and daily re-applying it to the fissures and uncovered parts. Dr. Liman relates one case in which it was applied in an extensive burn with immediate advantage, and ultimately a speedy cure, without remaining contractions of the integuments.—*Boston Med. and Sur. Journal*, from *Casper's Wochenschrift*.

Chloroform, an Antiseptic and Substitute for Quinine.—Statements have been recently laid before the French Academy of Science, that chloroform has been found to be an antiseptic of great virtue, preventing animal decomposition after death, or promptly checking it if already commenced. Besides this use of chloroform, Prof. Delieux, of Rochefort, has recommended it as a substitute for Quinine. He has treated various cases of periodic fevers with this remedy, with regular success. He administers it in doses from 9 to 30 grains, according to the severity of symptoms, mixed with syrup and water.—*Ibid.*

Success of the Kouso in the expulsion of Tape Worm.—To the Editor of the Lancet: Sir—I have much pleasure in forwarding for the Lancet the particulars of a successful trial of the kouso.

Mr. B—, residing in Cheapside, a delicate looking young man had been troubled with tænia for some years, and had taken the usual remedy, turpentine, with partial success, having at times seen parts of the worm only. I obtained a bottle of kouso from my druggist, which my patient took on on Sunday morning the 15th; the monster was expelled, *tête et col* complete, measuring twenty-one feet. I need not add that my patient was highly delighted at the good effects of the kouso, and has presented me with the largest specimen of a tape worm I have ever seen.

I am, Sir, your obedient servant,

THOMAS SMITH.

—*Western Jour. Med. and Surg.* Feb. 1851.

Oil for Lubricating Machinery.—M. BOUDET describes an oil, which the French call *liard*, used for greasing machinery. It is made by adding one part of caoutchouc, cut into small pieces, to fifty parts of rape-oil, and applying heat until the caoutchouc is nearly all dissolved. This oil is more unctuous than most of the oils used for machinery, and is not so much affected by the rapid motion of the parts to which it is applied, or by other influences to which it may be exposed. It remains fluid at temperatures below the freezing point of water, and offers little obstruction to the commencement of motion in the machines.

M. Boudet suggests the following method of determining the proportion of caoutchouc contained in this kind of oil:—A weighed quantity of the oil is saponified with potash, and the dry soap treated with spirit, which dissolves the soap with the aid of heat, and leaves the caoutchouc. The insoluble residuo is washed with water containing a sixth part of spirit.—*Pharm. Jour.* December, 1850, from *Journal de Pharmacie*.

Preservation of Protosulphate of Iron. By M. GIOVINNI RUSPINÉ.—The extreme facility with which protosulphate of iron passes to the state of persulphate when exposed to the air, has induced many Chemists to seek an easy and sure method of preventing this oxidation. Selmi, Geisler, Bous-

dorff, Abich, Boudet and Poma, have each in their turn devised methods of preservation, which have not been found to answer perfectly. M. Ruspiné having directed his attention to the same subject, and tried several processes, recommends the following as the best:—The crystals of the protosulphate of iron, perfectly pure, are dried, as quickly as possible, between folds of filtering paper, on taking them out of the mother-liquor. They are then put into a drying-closet, the temperature of which is 86° Fahr., where they soon effloresce. As soon as the salt has been reduced to this state, it is rapidly powdered, passed through a fine seive, and put into well-stopped bottles. Thus prepared, the protosulphate will keep for any length of time in a state of purity, although exposed to air and the influence of light. It will form a clear solution, and will contain only a trace of persulphate, which will be of little consequence. The preservation of the salt is due, in this case, to the abstraction of interposed water not in a state of chemical combination, which is always present in the crystals in their ordinary state, and which under the influence of air, causes the peroxidation of the salt.—*Ibid*, from *Journal de Chimie Médicale*.

Notice of the Seed of Simaba Cedron, used by the Indians of South America as a Remedy for Snake Bite.—In the *Pharmaceutical Journal* for January (page 344,) we find an account of the *cedron* from the pen of Sir W. J. Hooker. From this it appears that a seed, or the cotyledons of a seed, have been celebrated in New Grenada for its medicinal properties, under the above name. Dr. Purdie, late botanical collector for the Royal Gardens of Kew, writing from the province of Antioquia near the Magdalena, in July, 1846, observes: “I have had the good fortune to detect the celebrated *cedron*, a small tree with the habits of the Jamaica mountain pride, (*Melia azedarach*.) The seeds are here much sought after, and sold at one real the cotyledon, being considered an invaluable specific for the bite of snakes, for intermittents, and for stomach complaints generally. The bark and wood also abound, in a high degree, with the bitter principle.”

“The *cedron* has an erect stem not more than six inches in diameter, crowned by an umbellate mass of branches, with large handsome pinnated foliage.”

The *Brussels Herald* informs us that some physiological experiments are in progress to test the antitoxical powers of the *cedron*; two French gentlemen having volunteered to be operated upon in reference to snake bite. If this statement is correct, we shall probably know more of the real merits of this remedy in reference to the most important of its attributed powers.

Dr. Pereira, in a note to Sir W. J. Hooker, observes: “To the taste, these seeds are intensely bitter, and doubtless like the bitter bark and wood of other simarubaceous plants, (*e. g.* *Quassia* and *Simaruba*) they possess the

properties of bitter tonics, and might be useful in dyspepsia, and perhaps even in ague. Notwithstanding the faith of the Panama doctors, I am afraid there is not a shadow of hope that these seeds will prove an antidote against snake poisons; all the reputed antidotes to snake poison having hitherto proved unworthy of trust when used under the eye of competent observers."

M. Planchon has the merit of giving a name and assigning a botanical station to the plant producing the *cedron*, and has called it *Simaba cedron*, of the natural family *Simarubacæ*. Those who desire to be more thoroughly acquainted with the plant, will find a full botanical description, accompanied by a well executed wood cut, in the journal above referred to.

Dr. G. R. B. Horner, U. S. N., in an article on California, published in the *Medical Examiner* for Feb. page 91, refers to the use of cedron in that country for intermittents, and states that it is derived from Panama.

On the Color produced by Tincture of Guaiacum on certain Vegetable Substances.—By J. H. VAN DER BROCK.—Sometime since, Schönbein published (*Central Blatt*, 1849, p. 173,) some experiments concerning the blue color which slices of potato acquire on the addition of tincture of guaiacum, and mentioned that the substance which becomes blue is more abundant near the skin and about the eyes of the potatoes than in any other part. Van der Brock has tested a considerable number of vegetable grains, &c., such as ripe and unripe French beans, common barley, rye, oats, pearl barley, wheat, peas, millet, buck-wheat, nuts, bitter and sweet almonds, rice, chest-nuts, alder-wood, oak-wood, &c., and he concludes that it is the albuminous matter of plants which probably produces this reaction. There are other bodies contained in plants which admit of this reaction, but they have as yet not been sufficiently recognized; they appear, however, to be substances which are in a state of speedy transformation produced by what is called, after Mitscherlich, *contact action*.

Amygdalin, legumin, starch and its isomeric substances, and tannin of gall-nuts, have no influence upon this coloration.—*Pharm Journal*, Jan. 1850, from *Central Blatt*., 1850, No. xl. and xli., p. 365.

Succinic Acid from the Residue of Sp. Ætheris Nitrosi. By H. REICH.—In the acid residue, obtained by the distillation of alcohol with nitric acid, in the preparation of sp. ætheris nitrosi, Reich found formic acid once only; but in several cases (at least in the collected residues preserved from one to four years) he found oxalic and malic acids, and always saccharic acid. These residues were manufactured into malate of lime, and from this succinic acid was prepared by fermentation with decayed cheese.—*Ibid from Ibid*.

Editorial Department.

PATENT MEDICINE TAX.—The period is approaching when the rights and feelings of those pharmacutists who sacrifice their pecuniary interest in discountenancing quackery, will be again infringed by the enforcement of this odious tax. The larger number of apothecaries are classed in the five dollar list, and should they happen to overlook the time when it is legally to be paid, some two or three dollars are tacked on in the shape of costs. We think this a fair case for the action of the Trustees of the College of Pharmacy, whose members are presumed to act up to the principles of the *Code of Ethics*, which takes high ground on the subject of secret formulæ. We have long believed that if the proper measures were taken to investigate the unjust working of this law, by legal process, many who now suffer would be relieved, and the expense of the investigation would be more than borne by one year's tax.

We have read the following communication on this subject from our friend Alfred B. Taylor, (than whom we know of no one more sedulous in avoiding the sale of nostrums,) with great satisfaction, and we believe it presents the misconstruction of the law in a clearer light than it has heretofore been exposed.

Mr. Editor:—In your "Editorial Department" for July, 1850, you made a few remarks on the "Patent Medicine Tax," (recently enacted by the State Legislature,) and showed the injustice to those "druggists who feel a desire to discourage quackery and act up to their profession by refusing to sell secret medicines in general," of requiring them by an unreasonable application of the law, to pay the tax for selling "*preparations* made by secret formulæ, as Henry's and Husband's Magnesia, M'Munn's Elixir, and others prescribed by physicians."

As the correct understanding of the legal liability is a matter of considerable interest to the Druggist, and as the law itself has not yet been published (I believe) in the "Journal," it is here subjoined with a few comments.

Extract from the Act of 10th April, 1849.

Sec. xxv.—In addition to the license now required by law to be taken out by venders of merchandise, all manufacturers, venders, agents, or other persons, (except regular apothecaries for the sale of simple medicines, the prescriptions of physicians, and the compounds of the Pharmacopœia, and the several Dispensatories of the United States,) engaged in the manufacture or sale of any nostrums, medical compounds, or patent medicines,—whether

pills, powders, mixtures, or in any form whatsoever, shall also take out from the proper city or county treasurer a license for manufacturing, vending, hawking, peddling, or in any way selling such nostrums, medical compounds, or patent medicines.

Sec. xxvi.—All such venders or sellers shall be classed and required to pay annually to the use of the commonwealth for their respective licenses, as follows:

Those who are esteemed and taken to make and affect annual sales to the amount of one hundred dollars, and not exceeding two hundred dollars, shall constitute the *fourth* class, and pay five dollars.

Those to the amount of two hundred dollars, and not exceeding five hundred dollars, the *third* class, and pay ten dollars.

Those to the amount of five hundred dollars, and not exceeding one thousand dollars, the *second* class, and pay thirty dollars.

Those to an amount exceeding a thousand dollars and not exceeding two thousand dollars, shall form the *first* class and pay fifty dollars: *Provided*, That those who are esteemed to sell an amount exceeding two thousand dollars, shall pay a tax of fifty dollars and three per cent. upon all sales above two thousand dollars.

Sec. xxvii.—"Any person convicted of violating the provisions of the preceding sections, shall be fined in a sum not less than fifty, nor more than five hundred dollars, for each offence; one half to be paid to the county treasurer for the use of the commonwealth, and the other half to the person or persons who shall prosecute such offender."

This law was framed by a committee of physicians with the avowed object of imposing a restraint on empiricism: it is therefore obvious to the commonest apprehension, that that construction cannot be a legitimate one, which tends directly to thwart this primary interest of the law. Our sagacious and *disinterested* tax-gatherers, have insisted that all articles *prepared* by a secret process, are liable to taxation. And as a variety of such articles are necessary to the stock of every respectable druggist, the most determined opponent of quack mixtures, is required to pay the same tax, as he whose sole business is the vending of patent medicines,—unless, indeed, the latter is *unfortunate* enough to fall within a higher class than himself! The tendency of all this, it is needless to add, is to make those who are taxed for what they do not keep, seek indemnification for their loss, by the profits from nostrums heretofore so sedulously avoided; in other words the law is made to *encourage* the sale of quack medicines!

Nothing can be clearer, on a careful examination of the language of the law, than that only those engaged in the sale of "nostrums, medical compounds, or patent medicines" are subject to this license tax. An article like "Henry's Magnesia" is certainly not a "medical compound," or a "patent medicine;" and is not a "*nostrum*." A "*nostrum*" is defined by Webster, to be "A medicine the *ingredients* of which are kept secret, for the purpose of restricting the profits of sale to the inventor or proprietor."

As you have well remarked in the "Journal" for October 1850, there is the widest distinction to be made "between a reservation of the skill and manipulations required in the preparation of a medicine, and a reservation of its composition. The most fastidious member of the College of Physicians, may use Henry's magnesia, without implicating his character as an opponent of quackery, because he knows what he prescribes as well as if he had witnessed its preparation; and any chemist can assure himself of its nature." The "*ingredients*" of Henry's Magnesia are not "kept secret:" most indisputably therefore, it is not a "*nostrum*."

It is equally clear, first, that all "compounds" recognized by "the several dispensatories," are specially *excepted* from the operation of the law; secondly, that all "prescriptions of physicians"—*whatever their character* are likewise expressly excepted; and thirdly, that all "*simple medicines*"—*no matter how prepared*, are as expressly excepted. *A "simple medicine" cannot signify an *elementary* medicine,—(as sulphur, charcoal, iron, &c.)—for such form a very small and comparatively unimportant class. It must signify one simple in its character and remedial action; that is, a medicine "not mixed or compounded." A strictly *chemical* compound, (as Magnesia, or its sulphate,) is not properly either "mixed," or "compounded:" it is not a "*medical* compound;" it is essentially a "simple medicine." Hence an improved manufacture of Epsom Salts, Magnesia, Quinia, or Morphia,—*whether by secret process or not*, cannot come within the operation of the tax.

Lastly. It is plainest of all, that no vender of patent medicines can possibly be subject to this tax, unless he falls within one of the "classes" specially required to pay license. In other words, all who do *not* make "annual sales to the amount of one hundred dollars," are most positively excluded from any ratio of taxation under this law. The opinion of several distinguished lawyers (among whom may be mentioned the Hon. J. W. Ashmead—District Attorney, U. S.) have been consulted; they are all clear upon this point.

Yours very truly,

A. B. T.

A MERITED HONOR.—We learn with pleasure through the Boston Med. and Surg. Journal, and the London Medical Gazette, that "Mr. Jacob Bell, well known as the editor of the [London] Pharmaceutical Journal, has been returned Member of Parliament for St. Alban's by a majority of 129. We think that the introduction of this gentleman into the House of Commons will be beneficial to the interests, not only of those whose rights he has specially and ably advocated, namely, Pharmaceutical practitioners,

*It may well be questioned, whether the framers of the law did not evidently design by the parenthesis in the 25th sec. of the act, to "*except regular apothecaries for the sale of simple medicines, prescriptions,*" &c. *entirely from liability to the license law.*

but of the medical profession in general." If the character of the honorable Member is judged by the spirit manifested in his Journal, we can readily believe his elevation to a seat in Parliament will prove advantageous to the professions alluded to, and equally so to any other interests that come within the legitimate sphere of action of a member of the House. We know of no editor more fearless in the discharge of his peculiar duty, or in the advocacy of the rights of the profession he represents.

TRIAL AND SENTENCE OF AN APOTHECARY FOR A MISTAKE, RESULTING IN DEATH.—Many of our readers may recollect the occurrence of a fatal error in dispensing a prescription, at a store in Moyamensing, some months since, and which was fully noticed in the public papers at the time.

The prescription called for thirty grains of sulphate of quinia, to be divided into five or six parts. The proprietor of the store was absent from the city, and left his establishment in charge of his two assistants, both *students of medicine*, one having been in the store for some length of time, the other for a shorter period. Unfortunately, it fell to the lot of the latter to dispense the prescription, his senior, to whom properly belonged the duty, being pre-engaged, but in the store. By a most unaccountable confusion of ideas, or absence of mind, the young man took the sulphate of morphia bottle (which was labelled) weighed out the potent salt, and dispensed it, impressed with the idea that he was handling sulphate of quinia. A dose was administered to the patient, a young lady of eighteen, and had time to work its fatal consequences, unchecked by treatment, before the attendants were attracted by unusual convulsive symptoms, which induced them to send for the physician. The latter at once surmised there was something wrong, went to the apothecary, asked to see the prescription, and, finding it correct, called for the vessel from which the powder had been taken, when, true to his previous infatuation, the young man handed the bottle of sulphate of morphia, and not until the physician called his attention to the label did the appalling truth flash upon him. The poisoning, despite the most unremitting endeavours of the medical gentlemen, terminated fatally.

In process of time a true bill was found by the Grand Jury against the young man and his employer, notwithstanding the latter was absent from the city at the time of the mistake. When the case reached the Court, William McFadden (the assistant) plead guilty, per accident, which at once relieved his employer from the unpleasant and *unjust* position in which circumstances had placed him. The jury brought in a verdict of involuntary manslaughter against the defendant.

In our opinion the Grand Jury committed an error of judgment in implicating the employer, until they had proved that his proper substitute and *responsible agent*, the elder of the assistants, was incapable of attending to the duties of the shop, in a correct and efficient manner. If his first assistant was

capable, the employer was as free from censure as his nearest neighbor. In a well regulated store, the elder assistant is responsible for the acts of his subordinates, in any matter relating to the service of the public committed to his charge, most especially so as regards physicians' prescriptions; and this feeling of responsibility should not only be impressed on the chief assistant, but juniors should be early trained not to rely too much on their own judgment, (however strong the temptation of a laudable ambition to learn fast,) but in all but the most common and well understood cases, to consult their senior. Had Mr. McFadden pursued this course, and been directed by his superior to do as he did, he would have been blameless for the result; nor can we exonerate his companion, in this instance, from the responsibility of the act, as it was his duty to have *seen* that the prescription was properly dispensed, especially in a case where the dose was unusually large.

On the 22d of March, according to the Evening Bulletin of that day, "William McFadden was sentenced to three months in the County Prison." Judge Parsons, after pronouncing the sentence, said "that he was convinced that the act was accidental, and it could not be attributed to a want of knowledge in the preparation of medicines, for the defendant was esteemed by distinguished physicians and professors, for his studious habits, and knowledge of the business in which he was engaged."

The Judge, very properly, expressed his sympathy for the young man, whose excellent moral character, he hoped, would in no wise suffer by this unfortunate occurrence.

Whatever opinion may be formed of the justice of this sentence by those whose familiarity with the exigencies of a dispensing business can best qualify them to judge, it must be admitted that the Court has done its duty, and by this act has shown what may be expected in future. Our first impression was that the punishment was too severe, in view of the accidental character of the error; and that it should be classed with the mistakes of mothers and nurses, in giving laudanum for paregoric; but on reflecting that the Apothecary claims the patronage of the public on the grounds of his special qualification for the services they require, in justice, we cannot but approve of the sentence, whilst we would that a pardoning hand was stretched forth to relieve its subject. Let pharmacutists be wise and profit by the example; let them not only seek protection, in the careful selection of assistants, and the instillation into these of the responsibility that should be *felt*, and the accuracy that should be *manifested* in the act of dispensing; but also place a guard against errors of inadvertence, by such a location, and conspicuous labelling of potent medicines, as shall render their unintentional substitution almost a miracle; and above all, let them impress on the minds of their junior assistants, from the first day of their service, that no poisonous drug shall be dispensed by them without the knowledge and approval of their seniors, much less a physician's prescription, until such time as their knowledge and experience shall sanction it.

COLLEGE OF PHARMACY AT BOSTON.—Since the announcement in our last number, of the movement among the apothecaries of Boston, we have been looking for its results. On the 13th of Dec. another meeting took place, at which it was "*resolved*, that it is the unanimous sense of this meeting that there should be an institution for the cultivation of pharmaceutical knowledge." "It was therefore voted that a committee of five be appointed to consider the subject, and report some draft for the formation of a pharmaceutical society to the next meeting." A committee consisting of Messrs. T. Restieaux, H. W. Lincoln, J. Kidder, Jr., and S. R. Philbrick, and D. Henchman, were appointed; the latter declining to serve. We hope this movement will be productive of substantial results, and open another arena in which pharmaceutical talent may expand and produce its fruits.

NEW YORK COLLEGE OF PHARMACY.—Through the *N. Y. Medical Gazette* for Jan. 1st, we learn that the officers of this Institution have addressed a memorial to the Legislature of the State of New York asking a pecuniary grant for the benefit of the College as a school for the education of Apothecaries. Our cotemporary remarks: "The memorial is ably written, and referring to the fact, that for twenty-one years this College of Pharmacy has been conducted by its members without any pecuniary aid from the State, respectfully solicits a donation of ten thousand dollars, and an annuity from the State of two thousand dollars per annum. The former sum they propose to appropriate to the erection of a suitable College building, and increase their library, cabinet of specimens, chemical and philosophical apparatus, &c.; while the latter sum they need for the remuneration of their professors, who have hitherto served the College with very inadequate pay."

We are not sufficiently acquainted with the temper of the Legislators of our sister State, to form any opinion of the success that such an application is likely to meet with, but for the cause of Pharmacy we hope the prayer of the memorialists may be granted. The pharmaceutical body in the city of New York is a large one, and, like our own and that of the other large cities, includes many practitioners of very meager qualifications. The fees of their School of Pharmacy are already too low, and should not be reduced; but with such a capital and income, they could present far greater inducements to the pharmaceutical student than they at present can. We know well the up-hill struggle that is requisite in building up the reputation of a school of Pharmacy, from the long and continued exertions that have been made in favor of our own school by the officers and members of our College, and we cannot but wish that our New York brethren may find some shorter route to success, than that which has necessarily been pursued by the pioneer Pharmaceutical School of the United States.

PHILADELPHIA SCHOOL OF PHARMACY, SESSION 1850—51.—The session just passed has been the most successful in the annals of the School, as it

regards the number of the class, and that of its graduates, catalogues of whom are subjoined. The medical profession in their annual association appear to have awakened to the importance of having Pharmacy conducted by persons fitted for {the business by practical and theoretical education. Where no law exists to compel qualification, the only influence that can be brought to bear is public opinion. The first action of the public voice is generally in favor of the man who appeals most strongly to the eye by his extensive show, or to the pocket by cheapness of price: but experience is a rough and impartial teacher, and has to a considerable extent convinced the medicine-buying public of the fact that it requires the possession of something more than colored bottles, a few drugs, and the implements for dispensing them, to constitute a pharmacist worthy of his responsible position. Physicians also are becoming more and more impressed with the truth that their success as practitioners depends largely on the ability and conscientiousness of the apothecary. To these two influences, therefore, viz: the sense of self-preservation in the people, and the demand for efficient co-operation from the practitioner, acting in unison, we look more for real pharmaceutical reforms than to the enactments of Legislatures.

In looking over the class we find several gentlemen who are engaged in business, and who, seeing the importance of a regular pharmaceutical education, have availed themselves of the advantages of our school at the sacrifice of considerable inconvenience. This is a favorable indication, and is a proof that with a proper spirit, the existing as well as the rising pharmaceutical body may be improved.

There are apothecaries who scout the idea of any benefit being derived from education beyond the precincts of the shop; who consider pharmacy solely as a practical art, requiring no study but what is picked up in the busy career of an apprenticeship. They argue that boys get their heads-filled with impracticable notions which interfere with the, to them, true principles of practice. Drugs which have heretofore been dispensed without a question as to value, are condemned by these juniors as unfit for dispensing, and practices to which long usage has given its sanction, are exposed as incompatible with the just principles that should regulate the conduct of the apothecary toward the physician and the public. Such are some of the lecture-acquired notions condemned by the opponents of pharmaceutical education. We have known the whole character of a dispensing establishment changed by the silent influence of apprentices stimulated by a wholesome ambition to excel, and sustained by just principles of action, in spite of the antiquated notions of their employers, who, with whatever sacrifice of self-importance, yielded to a course which trial proved to advance their pecuniary interests, whilst it increased their reputation.

Mere lectures will not make apothecaries, but oral instruction properly illustrated by experiments and diagrams, when addressed to earnest young men or boys engaged in the daily routine of the shop, is productive of the

highest usefulness. It corrects their crude notions of the phenomena they meet with; it suggests improvements in shop practice, followed from mere tradition, and it opens out before them as an illustrated map, the length and breadth and the capabilities of their profession, as a sphere of usefulness and a field of ambition. We know that some boys and even young men who are sent to the lecture room derive comparatively little from its teachings, because they are not interested, their minds are wandering far from the subject that should have engaged them as pharmaceutical students, and their bodies are often as far from the lecture room as their minds, engaged in the pursuit of frivolous amusement, frequently as hurtful to their moral sense, as it is devoid of mental improvement. As well might argument be brought against common schools because idlers neglect their duties.

Extract from the Minutes of the Board of Trustees of the Philadelphia College of Pharmacy.

At the Annual Examination at the School of Pharmacy, the following named gentlemen, having complied with the rules of the College, and having passed a satisfactory examination, were declared by the Board of Trustees Graduates of the Philadelphia College of Pharmacy.

James B. Campbell,	Thesis on Vin. Tinct. of fresh root of colchicum.
Robert Ramsden,	“ Phytolacca Decandra.
Henry M. Troth,	“ “ “
D. F. Goodyear,	“ Nepeta Cataria.
John C. Savery,	“ Fluid Extract of Serpentaria.
Alfred A. B. Durand,	“ Hydrastis Canadensis.
Thomas H. Montgomery,	“ Scammony.
James Stratton,	“ Pharmacy.
J. Henry Abbot,	“ Panax quinquefolium.
Louis Hughes,	“ Fluid Extracts.
Samuel S. Garrigues.	“ Matricaria.
Weatherill Peterson,	“ Eupatorium Perfoliatum.
George Canby,	“ Phosphate of Ammonia and Magnesia.
William King,	“ Commercial varieties of Sarsaparilla.
William Taylor,	“ Fluid Extracts.
Charles S. Braddock,	“ Salix Babylonica.
John D. Finley,	“ Syrups of the Pharmacopœia.
William D. Elliot,	“ Cimicifuga Racemosa.
Louis De Barth Kuhn,	“ Pharmaceutical Ethics.

The Annual Commencement of the College will be held on Friday, the fourth of April, at the Sansom Street Hall, on which occasion the Degree of Graduate in Pharmacy will be publicly conferred upon the above named gentlemen.

The Valedictory Address will be delivered by Professor ROBERT P. THOMAS of the Institution.

THOMAS P. JAMES, Chairman,

ALFRED B. TAYLOR, Secretary.

PHARMACOPŒIA OF THE UNITED STATES OF AMERICA. Published by authority of the National Medical Convention held at Washington; A. D. 1850. Philadelphia; Lippincott, Grambo & Co. p. p. 317.

We have the pleasure of announcing the publication of the new United States Pharmacopœia. Although delayed several months beyond the year of its commencement, it has been issued a year earlier than the edition of 1840. We have neither time nor space to notice its contents in this number, but may say the typography, paper, etc., are of a quality creditable to the publishers and worthy of the work. The following is a list of the newly introduced drugs and preparations.

I. SUBSTANCES INTRODUCED INTO THE MATERIA MEDICA.

Aconiti Radix.	Macis.
Althææ Flores.	Oleum Amygdalæ Amaræ.
Arnica (<i>flowers.</i>)	Oleum Morrhuæ.
Arsenicum.	Ovum.
Cydonium.	Plumbi Nitras.
Extractum Cannabis.	Potassæ Chloras.
Gossypium.	Spiritus Vini Gallici.
Helianthemum.	Vinum Rubrum.
Lappa.	

II. PREPARATIONS INTRODUCED.

Acidum Gallicum.	Extractum Cubebæ Fluidum.
Aconitia.	Extractum Opii.
Aqua Amygdalæ Amaræ.	Extractum Piperis Fluidum.
Argenti Nitras (<i>in crystals.</i>)	Extractum Rhei.
Argenti Oxidum.	Extractum Rhei Fluidum.
Arsenici Iodidum.	Extractum Sarsaparillæ Fluidum.
Calcis Carbonas Præcipitatus.	Extractum Sennæ Fluidum.
Ceratum Zinci Carbonatis.	Extractum Spigeliæ et Sennæ Fluidum.
Chloroformum.	Extractum Valerianæ Fluidum.
Collodium.	Ferri Citras.
Emplastrum Ammoniaci cum Hydrargyro.	Ferri Pulvis.
Emplastrum Picis Burgundicæ.	Glycerina.
Extractum Colchici Aceticum.	Infusum Capsici.
Infusum Sassafras Medullæ.	Potassæ Citras.
Infusum Taraxaci.	Potassii Bromidum.
Infusum Zingiberis.	Syrupus Acaciæ.
Liquor Arsenici et Hydrargyri Iodidi.	Syrupus Acidi Citrici.
Liquor Ferri Nitratis.	Syrupus Pruni Virginianæ.
Liquor Magnesicæ Citratis.	Tinctura Aconiti Radicis.
Mistura Glycyrrhizæ Composita.	Tinctura Cardamomi Composita.
Oleum Copaibæ.	Tinctura Kino.
Oleum Tabaci.	Tinctura Nucis Vomiceæ.
	Trochisci Sodæ Bicarbonatis.

Oleum Valerianæ.
Pilulæ Ferri Iodidi.
Plumbi Iodidum.
Potassa cum Calce.

Unguentum Belladonnæ.
Unguentum Potassii Iodidi.
Unguentum Sulphuris Iodidi.
Zinci Carbonas Præcipitatus.

LECTURES IN THE
PHILADELPHIA COLLEGE OF PHARMACY.
Thirty-first Session of the School of Pharmacy, 1851-52.

The Lectures in this institution will commence on Tuesday, October 14th, and terminate about the middle of March. They will be held in the Hall of the College, Zane street, on Tuesdays, Thursdays, and Saturdays, two lectures each evening at 7 and 8 o'clock.

ROBERT BRIDGES, M. D., General Chemistry.

WILLIAM PROCTER, Jr., Theoretical and Practical Pharmacy.

ROBERT P. THOMAS, M. D., Materia Medica.

The lectures on Chemistry will embrace in a systematic view the laws, operations and results of this science, and its relations to Pharmacy. The elements concerned in inorganic nature, and their compounds, will receive such notice as their relative importance in this respect demands; and will be illustrated by experiment, diagram, specimens, and processes.

Organic chemistry will also receive its full share of attention, and all its compounds, possessing general or pharmaceutical interest will be brought under consideration in a similar manner.

The lectures on Pharmacy will treat, of the elementary operations required in the preparation of medicines; viz., the management of heat, the manipulations in the processes of pulverization, solution, evaporation, distillation, crystallization, &c.; all illustrated by the most approved models, diagrams and apparatus.

The pharmaceutical preparations of organic drugs will be considered as follows; viz. The simple preparations of each drug will be noticed under the head of that drug, and each compound preparation under the head of its chief constituent. Each class of preparations as tinctures, extracts, plasters, &c., will receive a general notice in its proper place. The classification of the subjects will be in groups founded on the nature of their chief constituents; as for instance: the amylaceous group, the gum yielding group, the resin yielding group, the tannin yielding group, the alkali yielding group, &c.: each group being prefaced by a general description of the principle or principles giving it name. The preparations of each drug will be preceded by such notice of its chemical constitution, as will exhibit the kinds of treatment best calculated to extract and preserve its active portion.

The course will conclude with the processes for those inorganic chemicals which may be prepared by the apothecary himself, when desirable, without any reference to their systematic chemical relations.

The lectures on Materia Medica will be exclusively devoted to vegetable and animal substances, their origin, commercial history, characters, composition, and medical properties, together with their adulterations and the means of detection. The course will be commenced with two lectures on structural botany, and will be made practical and demonstrative by the exhibition of an extensive collection of the substances, their varieties and falsifications, aided by accurate drawings, and a full series of exotic and indigenous plants in their dried state.

Experiments illustrative of the proximate organic principles and modes of their detection, with the difference between genuine and spurious articles, will be introduced whenever deemed interesting or important.

Tickets for each course, \$8 00, to be obtained from the Professors.

Matriculation ticket, \$2 00, to be procured of the Secretary,

ALFRED B. TAYLOR,
Corner Walnut and Eleventh Sts.

SCHOOL OF PHARMACY

OF THE

PHILADELPHIA COLLEGE OF PHARMACY.

Catalogue of Students at the Session 1850-51.

1 Abbott, J. Henry	Philadelphia, Pennsylvania.
2 Agnew, Henry	" "
3 Alexander, Maurice W.	" "
4 Badger, Jr., Samuel	" "
5 Baker, Charles H.	" "
6 Baker, Jefferson	" "
7 Baker, T. Roberts	Richmond, Virginia.
8 Banes, John M.	Philadelphia, Pennsylvania.
9 Barelay, Philander W.	Kentucky.
10 Birch, Joseph	Philadelphia, Pennsylvania.
11 Boyle, Styles E.	" "
12 Braddock, Charles S.	Medford, New Jersey.
13 Buck, Ernst H.	Maine.
14 Campbell, James B.	Martinsburg, Virginia.
15 Canby, George	Philadelphia, Pennsylvania.
16 Caneda, Cipriano	" "
17 Crooks, Hermann H.	" "
18 Davis, John L.	" "
19 Davis, John W.	" "
20 De Benneville, James S.	" "
21 Downs, Michael J.	" "
22 Durand, Alfred A. B.	" "
23 Earley, William P.	Westchester, Pennsylvania.
24 Eggert, Charles H.	Bethlehem, "
25 Elliot, William D.	Philadelphia, "
26 Faunce, John H.	" "
27 Finley, John D.	Salem, New Jersey.
28 Fondée, Per Lee	Poughkeepsie, New York.
29 Franks, Edward Gay	Lewistown, Pennsylvania.
30 Gahan, Edward	Dublin, Ireland.
31 Garrigues, Samuel S.	Philadelphia, Pennsylvania.
32 Gibbs, John W.	Minersville, "
33 Goodyear, D. F.	York, "
34 Goldsborough, J. R.	Cambridge, Maryland.

35 Griffith, Robert E.	Philadelphia, Pennsylvania.
36 Hatfield, Alexander P.	Chester Co., "
37 Hendel, Samuel D.	Philadelphia, "
38 Henry, James R.	" "
39 Heyser, William	Chambersburg, "
40 Holden, John	Frankford, "
41 Howard, Charles	" "
42 Hughes, Louis	Philadelphia, "
43 Humbert, William G.	" "
44 Humphreys, Jesse B.	Montgomery Co., "
45 Humphreys, John	Philadelphia, "
46 Jones, William	Ireland,
47 King, William	Philadelphia, Pennsylvania.
48 Kuhn, Louis De B.	Adams Co., "
49 Lemberger, Joseph	Lebanon Co., "
50 Lochman, C. L.	Philadelphia, "
51 Moffit, Charles E.	" "
52 Montgomery, Thomas H.	" "
53 Moore, Robert	Baltimore, Maryland.
54 Morris, J. H. Morton	Louisville, Kentucky.
55 Noblit, Joshua H.	Wilmington, Delaware.
56 Page, John J.	Frankfort, Kentucky.
57 Partenheimer, Edwin	Roxborough, Pennsylvania.
58 Patterson, William M.	Philadelphia, "
59 Peltz, Richard	" "
60 Perot, Joseph S.	" "
61 Peterson, Weatherill	Salem, New Jersey.
62 Pollard, Oscar	Philadelphia, Pennsylvania.
63 Pyle, J. Lindley	" "
64 Ramsden, Robert	Easton, "
65 Robinson, Edward T.	Richmond, Virginia.
66 Savery, John C.	Philadelphia, Pennsylvania.
67 Selfridge, Matthew W.	Allentown, "
68 Sharp, Jr., John R.	Maysville, Kentucky.
69 Sharswood, James	Philadelphia, Pennsylvania.
70 Sheaff, John F.	Delaware Co., "
71 Shultz, David A.	Adams Co., "
72 Sterling, William H.	Burlington, New Jersey.
73 Stoechel, George W.	Philadelphia, Pennsylvania.
74 Stratton, James	" "
75 Taylor, William	Lancaster City, "
76 Thomas, Jesse J.	Philadelphia, Pennsylvania.
77 Thompson, Wm. B.	" "
78 Tompkins, Wm. A.	" "
79 Troth, Henry M.	" "
80 Uhler, Jonathan K.	" "
81 Whitecar, William B.	" "
82 Brown Frederick E.	" "

THE
AMERICAN JOURNAL OF PHARMACY.

JULY 1851

ON DRUG GRINDING.

BY CHARLES V. HAGNER, of Philadelphia.

The twenty first volume, No. 1, January, 1849, of the American Journal of Pharmacy, contains an interesting article on the subject of Drug Grinding by Mr. Redwood. It is of peculiar interest to me, and in conversing with different druggists on the subject I have been repeatedly asked to make known some of the results of my experience in that line, and to furnish some views and observations on the article referred to. My experience has at least been of some duration; I have been powdering drugs for this city, man and boy, thirty-nine years, having commenced it in 1812-13. My competitors of that day were John Price, a perfectly dependable and honest man in his business, and an individual named Jack West. They operated with rude horse-power mills, and quite primitive apparatus. They will be remembered by all the old druggists and apothecaries of this city, who will also doubtless remember, that not long after I commenced the business, I succeeded in raising the standard of powders (in point of fineness) equal if not superior to any in this country or in Europe, which standard I was subsequently *forced* to reduce by circumstances which I will state hereafter.

One of my earliest attempts at grinding drugs was on a lot of cream of tartar, some 6000 lbs., for Dr. Haral, an extensive drug-

gist of that day. He showed me the article ground, which was about the fineness of tolerable coarse common table salt, the custom then being to pound it in mortars. He asked me if I could grind it, I told him I thought I could, much finer than the sample, and at a lower rate than he had previously paid, (3 cents per lb.) I procured teams and hauled it to the Falls of Schuylkill, where I resided, and where my father had some mills. Being anxious to try the experiment, I commenced grinding it forthwith, about sun down, on a four feet pair of mill stones. Finding it to grind easily and rapidly, I continued at it until it was finished, about the middle of the night. By nine o'clock next morning I had it on the Doctor's pavement, much to his surprise and astonishment, and still more so when he examined the article and the style of the powder, which was altogether different from anything he had ever before seen. He seemed to think there was some enchantment or magic about it, and would not believe, until he tested it in various ways, that it was his cream of tartar. After some time, however, he became perfectly convinced of the fact, and paid me liberally for the job. This affair soon became known to the other druggists, and I had I believe, all their cream tartar to grind for some six or eight years, when my method of grinding it became known to others, and only within two or three years past adopted in London. From Mr. Redwood's drafts and description of the drug mills in London, and from what I have heard from other sources, they seem to be unacquainted with the use of mill stones in drug grinding.

My success in this affair led me into the business of powdering drugs generally, and I have been at it ever since. I could, I suppose, enumerate some twenty-five or thirty competitors I have had at different times, who have been tempted to go into the business from false and erroneous views of the profits arising from it, which they very soon discover are all fallacious; and they also become acquainted with the fact, that if they are honest in their business—not dealing in drugs—confining themselves entirely to a commission business, that is, powdering for others, as I have as a matter of caution and principle always done, they will, from the limited extent of the business, make little or nothing of it; and if, on the contrary, they are dishonest and fraudulent, they are

sooner or later discovered, and they lose their character and their business. I have in my time seen failures from both these causes.

There is, perhaps, no other business in which there are greater opportunities, more temptations to dishonesty and fraud, and more thanklessness—I may say *punishment*—for being honest, than in this business of powdering drugs. You have not only the temptations and fault-finding on one side to resist, but you have the punishment on the other side. Often have I been censured and frequently made to pay for losses in powdering drugs, which were altogether unavoidable and from no fault of mine, but from the nature and *state* of the article sent to me, which might have been avoided by adopting the plan I have every reason to believe is sometimes pursued elsewhere, of putting some foreign substance in the article to make up a portion of the loss in powdering.

It is perfect nonsense to expect a uniform loss in powdering any particular drug, with but few exceptions; cream tartar, for instance, is one from which there seems to be no evaporation in the process of grinding; on the contrary I have sometimes thought there was an absorption from the atmosphere sufficient in some cases to increase the weight. In this article I rarely lose more than from half to three quarters of one per cent, and most of that arises from extraneous substances—nails, chips, and other things we discover in it and throw out. Mr. Redwood states that the loss in powdering this article in London, is two per cent; from the slow and bungling manner in which they grind it there I only wonder it is not more.

We sometimes receive vegetable substances, roots, barks, gums, &c., direct from the hold of a ship, or from damp cellars; at other times we receive the same articles from the garret of a store, where they may have been for a year or more. It is ridiculous to expect the same loss in both cases. Most of the articles we powder contain more or less water, which we are obliged to dry out, and if we did not dry them artificially, when we reduced them to such minute particles as constitute a fine powder, the water would in a great measure escape by evaporation; this constitutes the loss in powdering drugs, at least the great amount of it. Some time back, I received a large lot of Bayberry bark from a house in this city, who had bought it without sufficient examination, for it had been

completely saturated with water, purposely, I suppose, by some "financier" to increase the weight. When I opened it and saw the condition it was in, I called the attention of the owner to it, but he had unfortunately already paid for it. I dried it, and it lost over thirty-five per cent. in the drying alone. Now what a position would I have been in had I been restricted to a loss of two or three per cent. It would have taken a considerable quantity of what Mr. Redwood facetiously calls "veritable powder of post" (saw-dust) to have made this matter straight.

Twenty years back I attempted to unite to my other operations that of chipping and grinding dye woods, and ground in all from fifteen to twenty tons for different parties; and although the wood appeared to be dry, it lost over two hundred pounds on each ton, caused by evaporation on being cut into fine chips across the grain of the wood. Of course I received the usual amount of "rowing up" for making such losses; so much so that I became heartily sick of the business, and sold out, at half the cost, the apparatus I had erected.

It is customary to remedy this difficulty, not with "powder of post," but "aqua font." Under the pretence that it improves the quality, water is freely used, not only to make good the loss, but a little further, and the consumer is made to pay a pretty high price for water. I have seen barrels of chipped wood that have laid some time in a store, fall short from fifteen to twenty pounds of the marked weight. I think it is a fraudulent and useless custom. If the article is really improved by the operation, (which I very much doubt,) there is plenty of water in every dye-house; let the consumer water it as much as he chooses, let the dealer sell him wood, not water, and charge accordingly, and let the chipper be a "hewer of wood," but have some compassion on him, and do not also make him a "drawer of water."

The important article of opium comes to us in very different conditions. I believe it is the general custom of the druggists to keep this article in their cellars to prevent its drying and losing weight; some, however, do not, particularly when it is intended to be powdered; of course the loss in the former must necessarily be greater than in the latter instance, and it would be perfectly unreasonable, under such circumstances, to bind the powderer to a regular per centage of loss in powdering opium. I have been in-

formed, and I believe correctly, that there exists in some other places a conventional rule of six per cent. in powdering opium ; so far as I remember, I rarely, if ever, powder it at a less loss than eight per cent., and sometimes as great as twenty per cent. I have examined my books in reference to the last 12 lots of opium powdered ; and find they amount to 165 lbs. 12 oz. received, and 142 lbs. 2 oz. returned ; the least loss eight per cent. and the greatest near twenty per cent., the average being 14 lbs. 5 oz. per cent. Mr. Redwood gives the average loss in powdering this article in London at 14 lbs. 14 oz. on the 112 lbs., the greatest eighteen and the least six per cent.

It would be a very easy matter for any druggist to ascertain the loss in drying any particular lot of opium, by cutting a portion into very small pieces and drying it sufficiently to make a *fine* powder. Yet notwithstanding this simple method of ascertaining the fact, I have met with instances (not many, to be sure, and none lately,) where persons have sent their opium elsewhere to be powdered, for no other reason than that of the loss being less than I made. Perhaps I might have satisfied them had I have made use of the "powder of post," or something else, which is and must be done by every one who powders ordinary opium at a loss of only 6 per cent. This, however, I never have done and never will do. I do not profess more honesty than my neighbors ; but if I had no scruples on the subject, I can imagine a case where I might make myself amenable to justice as a participant in causing the death of a fellow being, whose life might be lost for the want of a proper article being administered. I repeat, if there were no other motives, I would not under any circumstances make myself liable to such a charge. Opium is one of the most important of the drugs that pass through my hands. Every physician, druggist and apothecary, knows the importance of having it right, and, so far as it depends on me, it shall be right, be the loss in powdering what it may.

With a conventional loss of 6 per cent. there can be no uniformity in the article. A powderer receives a lot of opium so dry that it only loses 6 per cent. in powdering. He receives another lot that loses 20 per cent. To bring the loss on the latter to the same as the former, he must put in 14 per cent. of adulteration, and then you have one article 14

per cent. less in efficiency than the other. From some cause unknown to me, the consumption of powdered opium has greatly increased in the last five years, and seems to be increasing annually, if I may judge from the quantities I powder.

From what has been said above, it must not by any means be inferred that I have ever been asked by any druggists to adulterate their opium; this has never been the case. The only effect has been very frequent and severe scoldings about the loss; but I have got used to these, and always look for them as a matter of course. Indeed, I have long been satisfied that there are very wrong impressions prevailing on the subject of adulteration of drugs in this city, at least as it regards those kinds that pass through my hands. I have no interest in this matter; my business is to powder all articles sent to me, good, bad or indifferent. I neither buy nor sell drugs—know little or nothing about their cost or value, and whether they be adulterated or not, is of no pecuniary interest to me. I am therefore perfectly disinterested, and under these circumstances assert positively, that for many years past I have not been asked by any druggists to adulterate any of their drugs. I often receive articles to powder that I think are not very good, and often receive mixtures of the same article to powder together. For instance, a druggist may have rhubarb of a dark color and send me some of a lighter color to be mixed and powdered with it. Again, I sometimes receive two or three different kinds of bark to be powdered together—these things are of frequent occurrence—but as to adulterating drugs with a foreign substance, never. I know that there is a considerable amount of suspicion prevailing among certain druggists on this subject. A suspects B, and B suspects A, but as far as my experience goes, I have no hesitation in saying they are all mistaken. Of course I do not know what is done in other establishments, I only allude to my own operations. Some years ago a powdering establishment was in operation here, and failed from one of the causes I alluded to before, which it is easy to comprehend, when I mention that on its being broken up, one of the hands came to me for employment; of course he could do everything—powder this, powder that, and grind t'other—never had any difficulty except in one thing, and that was “grinding cream tartar.” I expressed my astonishment at this, knowing it to be the easiest thing in the

whole catalogue of drugs to powder; and on asking him what the difficulty was, he replied, quite innocently, "the alum always stuck the stones fast." Here was the secret; it seems it was the custom of the concern to grind alum with their cream tartar, and I saw in a moment the whole cause of this man's trouble and difficulty. Now I have not the slightest idea that this was ever done by the order or with the knowledge of any respectable druggist of this city. I have frequently heard (and I believe it is notorious) of this being extensively practised elsewhere, but this is the only instance that I ever knew or heard of its being done in this city.

It has frequently struck me as something singular, that in the manufacture of blue mass, I have never, in any instance, been asked or required by any one to make it of less proportion than one-third mercury. I have seen published at different times, here and in New York, analyses of different manufacturers' make, foreign and domestic, greatly falling short of their due proportion of mercury; yet, strange to say, I have been making it for years past—have made tons of it—the druggists send me all the materials to make it of, and in no single instance has it ever come to me in any other proportion than one-third of mercury. Here, again, I have no interest in this matter. It is of no consequence to me, pecuniarily, whether it comes in the proportion of one-third, one-fourth, or one-fifth mercury. I do not deal in the article, and I merely mention this in proof of what I have before stated as to the general correctness of the druggists of this city. Blue mass of my manufacture is in many hands—scattered in every direction—it is no great difficulty to make an analysis of it, and I fearlessly challenge investigation in proof of what I have stated above.

In speaking of the adulteration of drugs, I do not include those that come under the head of "spices." In these, here and everywhere, there is the most vile and abominable system of adulteration prevailing—not with druggists, however. I grind spices for many of them, and am never required to adulterate them, except in one article—ginger. To satisfy some of their customers, they are sometimes obliged to furnish a common and cheaper article of ginger. On these occasions, and they are rare, I grind a portion of corn with it, but it is done openly, always, I believe, with the knowledge of the purchaser, and sold as a common or adulterated article. This is the only exception in spices or anything else

that I am required to adulterate. With but two exceptions, I do not grind for the grocers; they can get their spices ground *cheaper* than I can grind them. Some of the "spice grinders," for instance, will grind a single bag of pepper for nearly what it costs me to send for and return it, and, I believe, make well out at that; perhaps some of them would even pay for the *privilege* of grinding it, if it were not for appearances. They understand all about "powder of post," and the good natured public are made to swallow a great many things they little dream of. Let us accompany one of our worthy epicurean citizens to his dinner and see what he dines on. He has a good beef steak before him, and puts in his plate a yellow substance composed of mustard, turmeric, meal and cayenne pepper. He likes cayenne, and sprinkles over his steak ground dye woods, cake meal, pepper, Venitian red, Spanish brown and the like. Perhaps he takes a fancy also to black pepper; here no one can tell what he gets—anything is good enough to make black pepper, the sweepings of the mill, old damaged rice full of insects, cake meal, (that is flaxseed after the oil is expressed from it,) mustard brand, &c. &c. Then comes the dessert—pies, custards, &c., flavored with cloves, cinnamon, allspice, mace, nutmegs, with all their *accompagniments*, too "numerous to mention;" and finishes his dinner with some beautifully colored strawberry ice cream, in which he sends after the rest a very pretty extract or solution of bugs, (cochineal,) a nauseous little insect, and our worthy friend arises from his table with the comfortable feeling of having made a very good dinner. It must, at least, be admitted, he has had a very considerable variety.

Mustard brand is a favorite article among spice *manufacturers* for adulterating black pepper. It is all very well if it is consumed before a certain time, but let it stand a few months, and then few persons will have the courage to put their noses in the pepper box. It contains a great quantity of oil, which soon becomes rancid; and as offensive as old rancid mustard is, when it is incorporated with pepper it is ten times worse.

In regard to the qualities of drugs that pass through my hands, there was undoubtedly a very great change—I might, perhaps, say, revolution—on the institution of the College of Pharmacy of this city. I remember it well. I was in full operation at the time, and had good opportunities of seeing the effect produced; and

ever since that time the large bulk of the drugs I have to do with are far superior to what they had previously been. The institution of the College of Pharmacy was about the same period of the introduction of quinine into general use. } Previous to that time I powdered immense quantities of Peruvian bark—1000 lbs. where I now do 50. The great bulk of it was a miserable spurious article, such as no respectable druggist of this day would touch. I rarely see it now. Nearly all the bark I powder now is of the best qualities; and so with other articles—jalap and rhubarb, for instance—both of which have greatly decreased in the quantity powdered, but improved in the quality.

Every experienced druggist is aware of the fact that the sale of powdered drugs has greatly decreased in this city, in the last fifteen or twenty years. There are several reasons for this; the principal one, perhaps, is that extracts and other preparations have taken the place of powders, but I believe their sale has not decreased in the same proportion in other cities. There is a special reason for this, and that has been the superior fineness of their powders; I allude now to their fineness of division, not their purity. Twenty years back ours were superior to theirs, but, as I stated before, I was *forced* to reduce the standard about fifteen years since, and I will now explain how it came about. For a period of about sixteen years I had pretty much a monopoly of the powdering for this city, and during all that time had a regular list of prices, precisely the same as they existed in New York, and from which I never deviated. My establishment was then, and is now, of sufficient capacity to powder in five months steady work, all the drugs that are required to be powdered in this city in a year, and, with the prices I then received, I could successfully compete with any one, and produce powders equal to any other place in the world. There is no difficulty in reducing powders to any required degree of fineness; the only question with me is, will it pay? About fifteen years since I had some competitors, who in order to obtain business, reduced the prices, at the same time reducing in a much greater ratio the quality or standard of the powders. The druggists insisted on my charging the same as they charged. I resisted as long as I could, but was finally obliged to give up, and the only thing I could do in self-defence was, at the same time to reduce my standard of fineness; and as it appeared to

me the druggists then cared more for cost than quality, all I could do was to accommodate them. It is comparatively an easy matter to reduce drugs to a certain degree of fineness, but to go beyond that is the trouble. The hard work and time employed increases in geometrical progression in proportion to their fineness. If one take a hammer, for instance, and strikes a stone, he breaks it into two pieces—it will take two blows to break it into four—four blows to break it into eight pieces, and so on. The time and labor of reducing a substance to a million of particles is little compared to what is required to reduce that million to twenty millions of particles. It was entirely impossible for me to put this additional labor on an article and receive no more for it than my competitors, who could powder in their way 100 lbs. in the same time and with the same force and power that it took me to powder 10 lbs. This is the whole story, and accounts for the inferior fineness of our powders for some years past. I am now endeavoring to bring up the standard. The druggists are becoming aware of the necessity of doing so, and it remains to be seen whether I shall succeed or not. I suppose the superiority of fine over coarse powders, in the practice of medicine, is universally admitted, and that the same rule that applies to mercury in blue pill, applies also to them; that is, the more minute the particles, the more surface they present for the action of the stomach.

I intended to have noticed in detail Mr. Redwood's article, and have much more to say on the subject; but I feel that I have already taken up too much space, and may perhaps some day resume the subject.

ON EUPATORIUM PERFOLIATUM.

BY WEATHERILL PETERSON.

(*An Inaugural Essay.*)

The Eupatorium Perfoliatum of the United States Pharmacopœia, belonging to the seventeenth class, first order of Linnæus, and to the Asteraceæ of Dr. Lindley, is one of the most common of our indigenous syngenesious plants.

It is found throughout almost the whole extent of our country,

and is more generally diffused than any of its numerous congeners. Though not possessed of much external beauty to recommend it to the notice of the casual observer, yet, the manner of its inflorescence and the connate or perfoliate character of its leaves, serve unmistakeably to distinguish it.

In the fresh state, the leaves, especially when rubbed between the fingers, have a peculiar, not disagreeable odor, which is lost to a great extent in the process of desiccation. The flowers, also, when recent, are agreeably aromatic, but in their dried condition they possess little or none of their peculiar aroma.

Though Boneset, like too many of our indigenous remedies, is but seldom called into requisition by the medical practitioner, for the cure of disease, yet, its very general employment in domestic practice, and the reputation which it has acquired in many sections of the country, seem to warrant the assertion, that it is deserving of more confidence than has hitherto been reposed in its virtues by the profession.

The taste of Eupatorium is peculiar, quite bitter and somewhat persistent. It unites the properties of a tonic with those of a diaphoretic, expectorant and emetic, and it has also been supposed to possess anti-intermittent virtues; and, indeed, it has been remarked by a physician of considerable eminence, that "it is not improbable that a principle, similar in properties to quinine, will yet be separated from it." Though I do not coincide in this opinion, yet, I am induced to believe that it contains some principle, *sui generis*, to which its tonic and emetic property is due.

Its peculiar virtues are at present thought to reside in a *bitter extractive*, but this is a sort of *generic term*, too extensively applied to the active principles of plants, and unworthy the name of a distinct principle.

With a view of determining the presence of an active principle, and, if possible, of obtaining it in an isolated form, I instituted a series of experiments, which, although unsuccessful as regards the separation of a principle to which the name *Eupatorin* would be applicable, may yet throw some light upon the proximate constituents of the plant in question.

Expt. 1.—Four ounces (troy) of dried Eupatorium, deprived of stems, were coarsely powdered and subjected to displacement with cold water, until one pint of a reddish brown infusion was ob-

tained: this was removed from the receiving vessel and the process continued until three pints more had passed, when the liquid came through nearly colorless. The liquid last obtained was evaporated to a small bulk, the first pint added and the whole evaporated to the consistence of an extract, which weighed 630 grains, and was reserved for future examination.

As the liquid which came through after the four pints above-mentioned were obtained, although nearly colorless, still possessed much bitterness, I deemed it advisable to continue the process, supposing that the gum, salts, and other matters readily soluble in water, had been dissolved out by the first portions of menstruum, and that the bitter principle now being taken up would be much more free from impurities. About four pints were thus passed through, when the operation was stopped. This was evaporated below 212° to about four fluid ounces, and filtered to separate insoluble extractive: the clear liquid was then reduced to a thick syrupy consistence, and treated with deodorized alcohol; the alcoholic solution was concentrated, treated with animal charcoal, which removed nearly all the color, and submitted to spontaneous evaporation, when a resinous looking matter of a brownish yellow color separated in globules, but ultimately formed a brittle mass amounting to twelve grains, upon the complete evaporation of the liquid. This was slightly soluble in water, to which it communicated a strong bitterness, abundantly soluble in alcohol and soluble also in ether. It was dissolved by caustic potassa.

It was redissolved in alcohol, treated with purified animal charcoal, and the solution again left to spontaneous evaporation, when the same resinous-looking matter was left as before, possessing the peculiar bitter taste of the plant.

Expt. 2.—The four ounces which had been previously nearly exhausted by water, were percolated with alcohol, when an intense green, bitter solution resulted; this was evaporated to a small bulk, decanted, and the matter adhering to the sides of the evaporator, (which seemed to be of a waxy nature,) washed with alcohol and added to it. Official acetic acid was now added as long as chlorophylle precipitated, and the liquid filtered; the clear solution was then evaporated, when, as the alcohol was drawn off, a black tasteless resin was deposited in considerable quantity. This resin was soluble in caustic and carbonated alkalies.

After the resin had ceased to precipitate, the clear liquor was decanted, decolorized by purified animal charcoal and evaporated, when a matter similar to that obtained in experiment first remained, but so contaminated with acetate of soda, derived unsuspectingly from the acetic acid used, that it was rejected.

On examining the chlorophylle upon the filter, it was found to contain a white matter; alcohol was added to wash out the chlorophylle, when it remained as a white crystalline powder, insoluble in water, alcohol, ether and liquor potassa, but soluble in nitric acid, producing a yellow color. Exposed to heat upon a plate of glass, it fused and was decomposed, giving off an odor similar to acrolein, and apparently leaving no residue. The amount obtained was quite small.

Expt. 3.—The aqueous extract obtained from four ounces as mentioned in experiment first, was treated with deodorized alcohol, which took up the bitterness and left gum, together with insoluble extractive, coloring matter, chloride of potassium and nitrate of potassa. The resulting tincture was treated with an excess of subacetate of lead, the excess of lead thrown down by sulphuretted hydrogen, and the liquid filtered; the clear solution was evaporated to dryness in a water bath to drive off sulphuretted hydrogen and acetic acid, and then redissolved in a small quantity of alcohol and reduced to a thick syrupy consistence. It was then treated with ether, which took up the bitterness, leaving a dark brown residue, soluble in water and alcohol, and precipitable by subacetate of lead. The ethereal solution was decolorized by purified animal charcoal and left to spontaneous evaporation. The result was a yellowish brown substance, similar to that obtained in experiment first, of a sweet odor, very bitter taste, and on the sides of the evaporating dish presenting the appearance of crystallization. A portion from the sides appeared, under the microscope, studded with numerous minute feathery crystals. A portion exposed to heat on a plate of glass, fused with a slight elevation of temperature, and was ultimately decomposed and burned off, leaving apparently no residue. When inflamed it burned with much smoke, leaving a bulky charcoal.

From these characters it would appear to be a resin, but its slight solubility in water, and also its affording evidences of crystallization, seem to distinguish it from resinous bodies.

Expt. 4.—An infusion in the proportion of an ounce (troy) to the pint when exposed to the air, readily underwent the vinous fermentation, which would seem to indicate the presence of sugar.

With this infusion, sesquichloride of iron gave a dense greenish-black precipitate, while a solution of gelatin gave but a scanty precipitate, showing the presence of but a small proportion of tannin.

Subacetate of lead gave a dense lemon-yellow precipitate, throwing down the coloring matter completely.

Expt. 5.—A decoction of the same strength as the infusion above-mentioned, gave with iodine no evidence of the presence of starch.

Strips of isinglass were macerated in the decoction until all the tannin was removed, and persulphate of iron added with a view of detecting gallic acid: a dark green precipitate resulted, less black than in the former instance, and upon allowing it to settle, the supernatant liquid was of a grass-green color. This proves the absence of gallic acid, as the precipitate and change of color were doubtless produced by the reaction of the iron with the coloring matter of the plant.

Expt. 6. One pound avoirdupois of the dry herb was distilled with four pints of water, until two and a half pints of clear distilled liquid were obtained; this was re-distilled from half a pound more of the herb, when the liquid still came over perfectly transparent, possessing a slight odor of the plant and a slightly bitterish taste. It was saturated with chloride of sodium and allowed to stand, but no milkiness was observed. It therefore contains no volatile oil in the dried condition, unless in exceedingly minute proportion.

From the foregoing experiments, the *Eupatorium Perfoliatum* appears to contain a peculiar bitter substance analogous to resin, but slightly soluble in water, chlorophylle, resin, a crystalline matter, the nature of which was not determined, gum, tannin, yellow coloring matter, extractive matter, lignin, chloride of potassium, nitrate of potassa, and probably a small portion of sugar and wax.

ON A SUBSTITUTE FOR McMUNN'S ELIXIR OF OPIUM.

By EUGENE DUPUY, Pharmaceutist, New York.

Within a few years the use of this preparation of opium has been much extended in the United States, through the medium of the press, as well as from the commendation of a numerous class of our practitioners, who found it to possess a sedative property which the ordinary Tincture of Opium does not possess in a similar way. Yet many amongst them reluctantly made use of it, from the fact that its mode of preparation was kept from the public, and that the usual abuse of such preparations, fostered by *directions for use without need of medical aid*, by mothers, nurses, etc., was a great objection to its employment by that class of practitioners who want to *know, not only* what is the effect of the medicines they administer, but also, what are their component parts, and how they are prepared. Having such men among the physicians honoring my establishment with their custom, I have endeavored to prepare for their use, substitutes for some of the nostrums possessed of some efficacy. As a result of my endeavors, I will state that my substitute for McMunn's Elixir has been tested for about six years, and that it has been found to possess the sedative property peculiar to it, without any of the unpleasant effects attributed to Laudanum.

The late Dr. Smyth Rodgers, formerly Professor in the New York College of Pharmacy, during his painful illness, had frequent recourse to it, and even preferred it to McMunn's preparation, according to his attending physician's statements, although he had, at first, great reluctance to try any thing else. An advantage in my substitute is, that its manipulation is exceedingly simple, and that a country physician having at hand the necessary ingredients, can prepare it as well as the more expert pharmacist. I prepare it as follows :

Opium,	-	-	-	℥x.
Water,	-	-	-	q. s.
Alcohol, 95 p. ct.	-	-	-	℥iv.

The opium is to be made into a thin pulp with water ; the mixture allowed to stand in a cool place 48 hours, then transferred

into an elongated glass funnel containing filtering paper; a superstratum of water equivalent to the bulk of the whole mass is added. When 12 ounces of liquid have been filtered, the alcohol is added to the filtered solution.*

About two-thirds of the substance of the opium is contained in the solution. The residue, consisting chiefly in resin, caoutchouc and narcotina, together with the ligneous matter. Consequently, my substitute is nothing more or less than an aqueous solution of opium, nearly free from narcotina, preserved by alcohol.

Various names could be devised for it, but as it is intended to represent an article already used under a popular name, perhaps the appellation of "Elixir of Opium" might be retained for it, if no other be suggested better adapted.

[*Note by the Editor.*—We are glad to receive a communication from New York. Notwithstanding the many able Pharmacutists in that city, they rarely favor our pages with a contribution.

The unpleasant effects of ordinary tincture of opium when administered to certain patients have long since originated attempts to modify that preparation, witness the *denarcotized* laudanum, Battley's sedative solution, and the preparation suggested by the late Mr. Duhamel, (*Amer. Journ. Pharm.* vol. xviii. p. 16,) which last is almost identical with the "Elixir" of Mr. Dupuy. The latter, however, has the advantage in more completely exhausting the opium and in being less alcoholic when finished. In common with many others, we have given an occasional thought to the probable mode of preparing the so called "McMunn's Elixir of Opium." It contains meconate of morphia, and hence is prepared with *neutral* solvents, so as not to disturb the natural state of combination in which the morphia exists. In glancing over the long list of the constituents of opium with the view of singling out those to which the unpleasant effects of laudanum may be attributed, perhaps none are more obnoxious to suspicion, than the odorous principle, resin, acid extractive, thebaine, and perhaps codeine and narcotina to some extent, although O'Shaughnessy and others, have shown that it is extremely doubtful whether the latter really possesses any disturbing quality of the kind. By the following process, a solution of opium can be made, deprived almost wholly of the principles it is desirable to avoid, and presenting the morphia in the form of its natural salt:

Take of Opium in powder, ten drachms (troy,)

" Ether,

" Alcohol, each, four fluid ounces,

" Water, a sufficient quantity.

*The proportion of opium is the same as that in Tinct. Opii of the U. S. P.

Macerate the opium in half a pint of water for two days and express; subject the dregs to two successive macerations, using six fluid ounces of water each time, with expression, mix and strain the liquors, evaporate them to two fluid ounces, and agitate the liquid with the ether several times during half an hour. Then separate the ether by means of a funnel, evaporate the solution of opium to dryness, dissolve the extract in half a pint of cold water, pour the solution on a filter, and after it has passed wash the filter with sufficient water to make the filtrate measure 12 fluid ounces, to which add the alcohol and mix.

The same result was arrived at by first digesting the powdered opium in ether at several macerations, until it was exhausted, then drying and exhausting it with water. The aqueous solution was evaporated to dryness and then re-dissolved, filtered, etc., as in the above.

The ethereal liquid was evaporated in each instance:—that obtained directly from the opium yielded a brown crystalline extract, weighing 22 grains; whilst that resulting from washing the solution of opium, afforded acicular crystals and groups of larger crystals in stellated form, with a little brown extract-like matter around the edges, amounting to two grains, and having but little odor, and which exists in the elixir of Mr. Dupuy. These crystals are not reddened in the slightest degree by nitric acid, which dissolves them with a yellow color. In this treatment, the ether removes all that the water has dissolved of the thebaine, the meconin, a part at least of the codeia, the odorous principle, meconate of narcotine, and fatty matter. The ethereal extract obtained directly from the opium, contains nearly the whole of the odorous matter and fatty matter, besides the narcotine, free and combined. The evaporation to dryness, and re-solution in water, removes the ethereal odor, and separates a portion of acid resin and extractive. Landerer, in another part of this number, speaks of the nauseating and other unpleasant effects of the exhalations from poppy plantations during the collection of the opium. May not the odorous principle of opium have something to do with this effect, and may not the removal or loss of this in the so-called *denarcotized laudanum*, and in *old opium pills*, be at least partially the reason of their diminished tendency to produce nausea and head-ache? Mr. Redwood considers the “sedative liquor of Battley,” to be an aqueous solution of opium evaporated to dryness to get rid of the acid resin, re-dissolved in water, and a small portion of spirit added to give it permanence.]

ON SOLUTION OF CITRATE OF MAGNESIA.

BY WILLIAM PROCTER, JR.

The extensive use now made of Solution of Citrate of Magnesia by physicians, and the favorable reception it has met at the hands of the medicine-taking community, and above all, its adoption in the last edition of the Pharmacopœia, are strong evidences of its real merits as a refrigerant and cathartic. The want of permanence of the solution, as frequently sold, however, has been the cause of disappointment to the patient, and of loss and annoyance to the pharmacist.

This change manifests itself by the gradual deposition of a white granular powder, which continues until sometimes the bottles are half filled with the sediment. The object of this paper is to explain the nature of this change, and to point out, if possible, a means of avoiding it.

Citric acid is what chemists call a tribasic acid, that is to say, it combines with *one*, *two*, or *three* equivalents of a base, so as to form three distinct classes of salts. It contains three equivalents of *basic* water besides its water of crystallization, and in uniting with a base to form a salt, this water is partially or wholly displaced by the base, according as one, two or three equivalents of the latter enter into combination. Citric acid contains one equivalent of water of crystallization, if deposited from a hot solution, and two equivalents if from a cold solution, by spontaneous evaporation. The commercial acid is the former, and its formula is $C_{12} H_5 O_{11}, 3HO + HO$. Brande states that citric acid of this constitution does not lose weight or transparency when exposed to a temperature of 212° , but that the acid containing two equivalents of water, by exposure to the same heat, loses all its water of crystallization.

1. One hundred grains of citric acid was dissolved in 700 grains of distilled water, and recently calcined magnesia carefully added to it until neutral to litmus. Thirty grains of magnesia was required. This is in the exact ratio of three equivs. of base to one of acid $3MgO, \overline{Ci}$. This solution, after standing 24 hours, commenced to deposit the white powder before alluded to, which ap-

parently ceased about the fifth day, occupying then about half the height of the bottle. The contents of the bottle were thrown on a filter, washed with water and dried. The dry precipitate weighed 120 grains. The washings, which were neutral, were then evaporated to dryness, and yielded a white residue, weighing 25 grains. Twenty grains of the precipitate, after ignition in a platina crucible, left a residue of 2.88 grains of magnesia.

Twenty grains of the same precipitate were dissolved in half an ounce of water by aid of a sufficient quantity of muriatic acid; ammonia was then carefully added, until the acidity of the solution was neutralized, and afterwards a solution of chloride of calcium was dropped in until it ceased to cause a precipitate. This, when collected, washed, dried and weighed, amounted to fifteen grains of citrate of lime, equivalent to 9.61 grains of citric acid. The precipitate which forms in a neutral solution of citrate of magnesia is therefore composed of $3\text{MgO}, \overline{\text{Ci}}, + 14\text{HO}$.

Thirty grains of a deposit in an ordinary bottle of citrate of magnesia, after being washed and dried left, after ignition, 5.8 grs. of magnesia.

Twenty grains of anhydrous magnesia were dissolved in a solution of 100 grains of citric acid in 700 grs. of water, and after standing two weeks, no precipitation occurred.

Twenty-two and-a-half grains of the same magnesia were dissolved in the same bulk of solution of citric acid. At the expiration of a week precipitation commenced, but ceased after it had accumulated to one fifteenth of the bulk of the solution.

The conclusions deduced from these experiments are: 1st, That the neutral salt, $3\text{MgO}, \overline{\text{Ci}}$, though at first very soluble, has a tendency to assume the crystalline state, and will separate from its solution although it may be mixed with a portion of the acid citrate.

2d, That the salt $2\text{MgO}, \text{HO}, + \overline{\text{Ci}}$, will keep a longer time without precipitating, and in proportion as the quantity of magnesia is increased above two equivalents, the tendency to precipitation increases.

3d. It would also appear, when the process of precipitation is once established in the solution by the separation of the tribasic salt, that under certain circumstances that salt continues to be formed and

precipitated at the expense of the bibasic portion, so as to leave the supernatant liquid more acid than at first. I have noticed this in but few instances, but in one of them, where a dozen bottles of the solution had precipitated largely, the liquid above the precipitate was excessively acid. This change may be accounted for by assuming $2(2\text{MgO HO, } \bar{\text{C}}\bar{\text{i}})$ to be converted into $3\text{MgO } \bar{\text{C}}\bar{\text{i}}$ which precipitates, and $\text{MgO, } 2\text{HO, } \bar{\text{C}}\bar{\text{i}}$, which remains in solution and causes the acidity.

In the formula of the United States Pharmacopœia, the proportion of citric acid to magnesia is nearly that of a neutral salt, there being an excess of about seven grains of the acid, which, added to the seven and a half grains contained in the lemon syrup, gives the acidity to the officinal solution. There is not a sufficient excess of acid in these proportions to keep the solution long from precipitating, and hence the propriety of the revisers in directing the quantities for but one bottle or dose. The presence of the syrup in the solution retards the precipitation of the salt, and unless in winter, it will generally keep a week.

In making enquiries among the apothecaries of this city as to the proportions of magnesia and acid they employ, I find the following :

Propor. in Neutral Citrate	Acid	100	Magnesia	30
" " U. S. Pharm.	"	100	"	29,55
" of A	"	100	"	30
" " B	"	100	"	29,5
" " C	"	100	"	29,3
" " D	"	100	"	29,1
" " E	"	100	"	25

The last solution, from the statement of the apothecary, keeps very well, which is probably due to its decided acidity.

It is the custom with some pharmacutists to make a dense solution of citrate of magnesia, pour the necessary quantity with the lemon syrup into the bottle, draw it full of carbonic acid water and immediately cork. Others derive the carbonic acid gas necessary to render the solution effervescent, from *bicarbonate of potassa*, 35 grains of which salt in crystals is added just before the cork is secured. As this salt contains nearly half its weight of carbonic acid, and dissolves much sooner than the carbonate of magnesia, as

ordered in the officinal formula, and moreover, does not affect the transparency of the solution, it has some advantages and merely adds a little citrate of potassa to the solution. The officinal solution contains, theoretically, 21.5 grains, or about 47 cubic inches of carbonic acid gas, while the solution occupies the space of 21 cubic inches.

The process of the pharmacopœia, when the carbonate of magnesia is pure and free from grit, is upon the whole nearly unobjectionable, for making the solution extemporaneously. Whenever the carbonate is impure, the last portion added, leaves a sediment in the solution. It requires, however, more time—at least half an hour being requisite to effect the solution of the last addition of carbonate.

When calcined magnesia is employed with pure citric acid the solution rarely needs filtering, and the small proportion of bicarbonate of potassa, as the source of the carbonic acid, dissolves so soon that a bottle can be prepared for use in a few minutes. The use of calcined magnesia, however, is by no means free from objection. I have recently ascertained that magnesia, having all the external characters of a good preparation, contained 25 per cent. of volatile matter, the larger part of which was water. Here, then, is a source of inequality in the strength and taste of the solution, it being much more acid at one time than another, according to the purity of the magnesia employed.

The quantity of (pure) calcined magnesia, equivalent to five drachms of carbonate is 125 grains, according to Fownes, and 134 grains according to Berzelius; the carbonate I have tried recently, corresponds more nearly with the constitution given by Berzelius than Fownes.

Although an acid solution will keep better than a neutral one, yet there are therapeutical objections to the presence of much acidity in it, which should prevent the apothecary from rendering the preparation permanent at the expense of its usefulness.

REMARKS ON FLUID EXTRACTS OF CINCHONA.

BY THE EDITOR.

Whatever may be said in favor of the particular medicinal qualities of Quinia and its salts, and whether or not it really embodies *all* the curative power of the cinchona barks, it remains to be true, that in many cases, a large number of physicians appeal to bark in substance, or in some galenical form, representing its soluble matter. The tinctures, the decoction, and infusion, and the several solid extracts, are called into service, but the former are too dilute and inefficient in ordinary doses, while the latter require to be administered in pilular form, which is not always desirable. It has therefore, been a desideratum to possess a preparation, having the conveniences peculiar to the fluid state, with such concentration as to render the bulk of the dose but moderate.

Mr. Donovan of Dublin, some years since, proposed a preparation (See Vol. xvii., p. 49, Am. Jour. Pharm.) which he called Syrup of Bark, but which required too much trouble and nicety of manipulation, to be generally adopted. He first exhausted eight ounces of calisaya with alcohol and water, evaporated the tincture and decoction separately, each to eight fluid ounces, mixed these, then added 315.31 grs. of dinoxalate of quinia, boiled a few minutes, and lastly dissolved in the liquid, 21 ounces of sugar, and four ounces of gum arabic, so that the whole should measure when complete, 32 fluid ounces.

Since then, Mr. Isaac C. Jones, a graduate of the Philadelphia College of Pharmacy class '49—'50, in his Inaugural Essay, proposed "a fluid extract of cinchona," made by exhausting eight ounces of yellow bark with water acidulated with muriatic acid, by the process of displacement, observing, to limit the quantity of muriatic acid to four fluid drachms, which is mixed with as much water as is necessary to exhaust the bark, viz., about four pints. The acidulated infusion is then evaporated to nine fluid ounces, and while yet hot, fourteen ounces of white sugar is dissolved in it, so that when finished, the whole shall measure a pint. Each fluid drachm or teaspoonful of the syrupy solution, represents half a drachm of bark or about one grain of quinia. This preparation is reddish brown and transparent when hot, but by cool-

ing, deposits cinchonic red, and becomes turbid. All the alkaloids are in solution, however, and by suffering the fluid extract to stand until the cinchonic red is deposited, it may be decanted perfectly transparent. It is exceedingly bitter to the taste.

More recently, Mr. Alfred B. Taylor, Pharmaceutist of this city, has made a fluid extract of calisaya bark, which is, perhaps, preferable to either of the foregoing, inasmuch as it presents the alkaloids in an unaltered condition, and yet fully exhausts the bark. The following is his process :—

Take eight ounces (Troy) of calisaya bark in a uniform coarse powder, moisten it with diluted alcohol, and after standing twelve hours, pack the moist bark properly in a percolator, and pour diluted alcohol on it gradually until four pints of tincture have passed, or until its bitterness is exhausted. Evaporate the tincture in a water bath (or a still) to nine fluid ounces, then add fourteen ounces (Troy) of sugar, continue the heat until it is dissolved and strain, whilst hot, if necessary.

This preparation like the preceding, is transparent, and dark reddish brown coloured whilst hot, but on cooling it becomes turbid to a greater degree, owing to the separation of the cincho-tannates of the bark alkalies. For the reason that a part of these are in an insoluble form, this fluid extract is less bitter and disagreeable than that made with acidulated water. It has the same theoretical strength, a teaspoonful being an ordinary dose, and it affords a very eligible means to the physician, of prescribing bark either alone or in combination with other agents, without the delay necessary to make an infusion.

Dr. John F. Meigs, who has used the fluid extract made by Mr. Taylor's formula, speaks favourably of its advantages.

ON THE SYRUPS OF TOLU AND GINGER.

BY JOHN D. FINLEY.

(*Extracted from an Inaugural Essay on Syrups.*)

Syrup of Tolu.—As this syrup is prepared in the present Pharmacopœia [Edit. 1840] it is in the form of a mixture; in the New Pharmacopœia it will be prepared from an aromatized sugar,

obtained by adding the tincture to sugar, allowing the alcohol to evaporate, and making it into syrup the usual way. As thus prepared it shows a slight milkiness. A better plan is the following, by which a syrup may readily be made of double the strength of that of the Pharmacopœia, and perfectly clear.

Take of Tincture of Tolu, two fluid ounces,
Carbonate of Magnesia, two drachms,
Sugar, a pound and a half, (Avoirdupois.)
Water, twelve fluid ounces.

Rub the tincture of tolu with the carbonate of magnesia and two ounces of the sugar, in powder, gradually add the water, and filter. The remainder of the sugar is then dissolved in the filtered liquid by means of a gentle heat.

Syrup of Ginger.—A stronger and more perfect syrup can be prepared by making a *ginger water* by the process directed above for syrup of Tolu, and dissolving the sugar in it with a gentle heat.

[We have tried Mr. Finley's processes as given above, and find them to produce syrups agreeably aromatic, especially in the instance of ginger. An accidental advantage of the use of magnesia in the preparation of syrup of tolu, is the saturation of the benzoic and cinnamic acids:—on the other hand, one seventh of the menstruum is alcohol, which, in a great measure remains in the syrup, and gives it an alcoholic flavor. If this was removed without injury to the aroma, the formula would be unexceptionable. In the ginger syrup the proportion of alcohol is less, and its presence is hardly perceptible. The aromatic taste of this syrup, derived from the volatile oil, is perfect, but the pungency which depends on the soft resin, is less marked than in the officinal syrup, although sufficiently so to render it, very agreeable, especially for mineral water purposes.—EDITOR.]

ON THE CHEMICAL AND PHYSIOLOGICAL PROPERTIES OF CHLORINATED CHLOROHYDRIC ETHER.

By M. MIALHE & M. FLOURENS.

Dr. Aran having requested us to place at his disposal the different volatile agents, to which anæsthetic qualities had been attributed, with the intention of studying, with more care than had hitherto been given to the subject, their sedative action, we

presented to him, at two different periods, liquids obtained by the reaction of chlorine upon bi-carburetted hydrogen, furnished to us under the name of Dutch liquid, by two of the most renowned manufacturing chemists of Paris. The first of these liquids, according to Dr. Aran, gave very satisfactory clinical results, which he feels it his duty to make known. With the second specimen he was not successful. During our researches into the cause of this difference, we found the last mentioned liquid possessing the characteristics of Dutch liquid, simply, while the former presented more analogy with liquid chloride of carbon, than with Dutch liquor, properly so called, showing a higher density, a higher boiling point, and being entirely non-inflammable.

In pursuing our comparative researches, we became convinced that the liquid was not chloride of carbon, but Dutch liquid, which had lost a certain quantity of hydrogen, and acquired an equivalent proportion of chlorine, *i. e.* chlorinated Dutch liquid.

It is therefore certain, that the happy therapeutic results, recently reported by Dr. Aran, should be attributed to *chlorinated* Dutch liquid, and not to that liquid in its ordinary chemical condition. But the price of this substance being too high to allow of its advantageous introduction into therapeutics, we have proposed to substitute for it, an analogous ethereal compound, proceeding from the action of chlorine upon chlorohydric ether.

It appears, from the able researches of M. V. Regnault, that chlorine, acting upon chlorohydric ether, takes from it hydrogen, forming chlorohydric acid, substituting itself in the place of the hydrogen, and giving birth to a series of compounds, more and more rich in chlorine, and which are all isomeric with the corresponding terms of the bi-carburetted hydrogen series.

The isomerism is complete, for not only is the elementary composition the same, but the densities of the vapors are identical. The order of molecular arrangement alone is different, thus clearly defining its chemical reactions.

We now concluded that these two etheriform series, were endowed with the same therapeutic virtues, and therefore, that chlorinated Dutch liquid could be replaced in clinical practice by the corresponding chlorinated chlorohydric ether. This new compound, tested practically by Dr. Aran, among his patients, has completely confirmed our conjecture; being found possessed of the same thera-

peutic properties as the chlorinated Dutch liquid. It is colorless, very fluid, having an aromatic ethereal odor, analagous to that of chloroform, but more resembling that of Dutch liquid; a sweet and stimulating taste; is completely without action upon litmus paper; with difficulty soluble in water, though perfectly and readily dissolving in alcohol, sulphuric ether and most of the fixed and volatile oils. It is not inflammable as are the officinal ethers and Dutch liquid; bearing resemblance in this point to chloroform. Its specific gravity not being uniform, and its boiling point varying with the density, from 110° to 130° centigrade, clearly indicate that this body is not an unique substance, but is constituted of several others of different densities and elastic tension.*

Inasmuch as the different chlorinated chlorohydric ethers all possess the same anæsthetic properties, and it would be a matter of impossibility completely to separate them, we propose to designate the liquid which they form by the generic name of *chlorinated chlorohydric ether*.

Such are the principal properties of this new anæsthetic liquid, which we think, with Dr. Aran, is called to play an important part among local sedatives.—*L'Abeille Medicale*, Jan. 28, 1851.

Flourens on Chlorinated Hydrochloric Ether.—A new substance has been proposed by chemists, as possessing in a very high degree the power of suspending the sensibility of the tissues in animals submitted to its influence. M. Flourens (on the 20th instant) informed the Academy of Sciences of Paris, of some experiments he has lately made, with the view of studying the effects of chlorinated hydrochloric ether upon animals. The learned physiologist has subjected several dogs to the inhalation of this ether (prepared by M. Ed. Robin,) and all of them were affected with general anæsthesia, some in from three to four minutes, and others in four

* The reaction of chlorine upon chlorohydric ether, gives rise to four ethers, viz.: the mono-, bi-, tri- and quadrichlorinated; the mono- and bi-chlorinated being the first obtained and the easiest to prepare, but too volatile to be advantageously employed as local anæsthetics. Treated with an excess of chlorine, they are converted into the tri- and quadrichlorinated ethers, which are much more dense and less volatile. The two last mentioned compounds, constitute more particularly, the chlorinated chlorohydric ether.—*Annales de Chem. et de Phys.* lxxi. 353.

or five. The sciatic nerve, which, in some of the cases, was laid bare, was found to have lost all sensibility, but to retain its motive power. Not one of the dogs died.

M. Flourens then tried the effect of injecting it into the arteries. He threw into the right crural artery of several dogs from 2 to 21.2 grammes (say 40 grains to 400) of chlorinated hydrochloric ether.

At the moment of injection the animal gave a cry of pain. There succeeded sudden paralysis of the posterior extremity; the sciatic nerve, laid bare, still retained its sensibility, but had lost all motive power. Chlorinated hydrochloric ether has, therefore, whether inhaled or injected, the same action as chloroform. This, injected into the arteries, immediately produces paralysis of the muscles, with tetanic rigidity; as also do the volatile oils of turpentine, mint, rosemary, fennel, &c. On the contrary, the ordinary ethers, the fixed oils, oil of olives, oil of naphtha, sulphuric acid, ammonia, and camphor, produce muscular paralysis, with relaxation of the fibres.

Moreover, these experiments appear to separate muscular from nervous action; for, on the one hand, tetanic rigidity exhibits itself even when the motivity of the nerve is not lost; and, on the contrary, muscular relaxation occurs while the motivity of the nerve remains. There is thus a visible independence in the action of the nerve, and that of the muscle.—*Med. News and Library*, Jan. 1858, and *Institute*, Feb. 8th, 1851.

THE SUMBUL OR JATAMANSI.

[The characters of sumbul or musk-root, as given in the following remarks, accord very well with a specimen of the root in the Cabinet of the Philadelphia College of Pharmacy.—EDITOR.]

The *sumbul*, of the character and therapeutic virtues of which French physicians know as yet very little, appears to have been employed in India from quite a remote period. Pietro Della Valle, who travelled in 1623, 1624 and 1625, through different portions of Asia, mentions it, to say that the *sumbul* is a root and

not a stalk ; although the word *sumbul* is applied in India, it appears, to a plant and to portions of a plant, employed as a perfume, formerly as an incense in religious ceremonies, and also as a medicine. W. Jones has asserted the true *sumbul* to be a species of valerian, known equally well among the Hindoos and Brahmins by the name of *jatamansi*. According to M. Granville, however, it is rather a plant of the family umbelliferæ, an aquatic plant, or living upon the margin of streams.

It has been, by mistake, stated that the *sumbul* grows in Hindostan. It is not found in any portion of the Indian territory occupied by the English.

It appears that it grows in Bootan and the mountains of Nepaul, and that although immense quantities of the dried plant are exported, no botanist has yet been enabled to describe the characters of a living specimen. A law of the country, it is said, prohibits the export of the living plant without the special authorization of the sovereign.

The *sumbul* does not present itself, as has been generally stated, in the form of a mass of leaves and roots of a greenish color, crumpled and pressed together. This error arose from the fact of a sample of this substance shown at St. Petersburg, having been previously mixed with a strong decoction of this same substance, which is of a greenish color. On the contrary, it appears as a thick, homogeneous root of two, three, or even four inches in diameter, cut into fragments of an inch or an inch and a half long, the section of which shows a fibrous texture and a yellowish white color. It is brought from the centre of Asia to Moscow, by way of Kiatka.

In all good samples of *sumbul*, the external envelope or epidermis, is found of a sombre or light brown color ; a greater depth of color, indicating greater age in the specimen whence derived.

This epidermis is very thin and strongly wrinkled. The inner substance is composed of coarse fibres, irregular and easily separated one from another, after having detached, the outer envelope, indicating a porous structure, resembling that of aquatic plants. If, after the removal of the epidermis an oblique or transverse section is made, an external layer white and veined is perceived, and an inner layer, thicker and of a yellowish hue. With the aid of a

powerful lens, small transparent points, having the appearance of granules of fecula can be perceived.

Two remarkable physical characteristics attract the attention during the examination of this root. In the first place its perfume, which can hardly be distinguished from the purest musk, and secondly, the powerful odor which it exhales when chewed. This musk-like odor is so marked, that some have even supposed the *sumbul* to have derived this quality from its contact with musk itself, during its progress from Asia to Europe, but such an idea falls to the ground before the facts that the *sumbul* retains this perfume, even when very old, that even when the outer portions are removed the interior is still strongly odorous; that the odor-giving principle itself can be isolated by chemical manipulation, and its very name, as given by botanists, is an argument of some weight. It is called *mochus-wurzel* or *musk-root*.

The aromatic taste is a no less distinctive characteristic. The first impression received upon tasting it is a slightly sweetish flavor, followed rapidly by a balsamic taste, and succeeded by a not unpleasant bitterness. As the mastication proceeds, there is felt in the mouth and fauces, a very marked aroma, accompanied by a sensation of warmth, the penetrating odor of this substance being imparted to the breath. These effects are much more evident, if in place of the root the alcoholic tincture is tasted, in which case the aromatic and stimulant flavor is very decided.

The chemical analysis of sumbul has been the subject of research by many German chemists—Reinsch, Schnitztin, Frichinger and Kalthofer. According to Reinsch, this root contains besides water, traces of an ethereal oil, two balsamic compounds, (*resins*) of which one is soluble in ether, the other in alcohol, wax, aromatic spirit, and a bitter substance soluble in alcohol and water.

A solution of this bitter substance, treated with lime and chloride of sodium, gives a sediment composed of gum, starch and saline matters. The balsams appear to contain the perfume, which, it may be remarked, becomes more intense if diffused in water.

The *sumbul* also contains an acid, to which Reinsch proposes to give the name of *sumbulic acid*.

Kalthofer has, moreover, investigated its pharmaceutical properties. He has obtained a yellowish alcoholic tincture of a musk-like odor, and a rather bitter taste, a yellow ethereal tincture of

similar odor and stimulating tastes, together with a waxy matter, which precipitates from the aqueous decoction.

From the foregoing, it follows that from *sumbul* can be obtained for medicinal purposes, two tinctures, one alcoholic, the other ethereal, appearing to contain different principles, and which can be given either alone or associated with other preparations; and, finally a bitter extract soluble in water, which can be given in pilular form.

The powder of the root may be administered either in substance or in pills.—*Journal de Pharm. from Union Medicale.*

ALOÏNE, THE PURGATIVE PRINCIPLE OF BARBADOES ALOES.

By M. J. STENHOUSE.

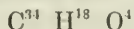
[In the *Journal de Pharmacie* for April 1851, it is stated that Messrs. T. & H. Smith of Edinburg, have recently discovered the active principle of aloes, to which they have given the name of *aloïne*, and which presents itself in the form of a crystalline neutral substance, of a straw yellow color. These Chemists consider it the purgative principles of aloes. The discovery was made whilst evaporating a cold aqueous solution of aloes in vacuo with heat; the syrupy solution was set aside for a few days, and on re-examining it, a crystalline deposit was noticed, which proved to be the principle above noticed. Dr. Stenhouse has made the following analysis of this substance, which is taken from the same source.—EDITOR.]

Mr. Smith, apothecary, at Edinburg, has prepared impure aloïne, by treating aloes, previously pulverized with sand, with cold water. Evaporated in vacuo to a syrupy consistence, the extract thus prepared, is filled in a few days with a mass of granular crystals of a brownish yellow color. This is impure aloïne. In order to remove the brown matter associated with it, they re-crystallize it repeatedly from warm water, until the crystals have acquired a sulphur yellow. In making these solutions the temperature of the solvent should not rise above 150° F. At 212° aloïne oxidises rapidly, and is decomposed. In a state of purity, this body crystallizes in stellated groups of small prismatic needles. Their purity is shown by the color, which should not deepen by

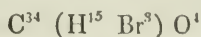
exposure to the air in desiccation. It is completely neutral; its taste, at first sweetish, very soon becomes intensely bitter. Sparingly soluble in the cold, it dissolves more easily by the aid of heat. The alkalies and alkaline carbonates dissolve it easily in the cold, forming a liquid of an orange yellow, which deepens rapidly upon contact with the atmosphere, from the absorption of oxygen. Boiled with alkalies or strong acids, it is rapidly transformed into a brown resin. It colors a solution of chloride of lime at first yellow, then brown. It is not precipitated by corrosive sublimate, nitrate of silver, or neutral acetate of lead. Concentrated sub-acetate of lead produces a precipitate of an intense yellow, soluble in an excess of water, and becoming deeper colored on exposure.

Fuming nitric acid dissolves it cold, without the slightest disengagement of gas, forming a reddish-brown liquid. Sulphuric acid added in great excess to this solution throws down a yellow pulverulent body, which explodes when heated, and probably contains the elements of hyponitric acid. When aloïne is digested with warm and concentrated nitric acid, it is transformed into chrysamic acid with disengagement of copious red fumes. There is not in this reaction the slightest trace of picric acid. By dry distillation, aloïne furnishes a volatile oil of an almost aromatic odor, and a considerable quantity of a resinous substance. Burnt upon a platinum plate, it melts and takes fire burning with a yellow and brilliant flame. There remains a charcoal, difficult to incinerate.

According to the analysis of M. Stenhouse, the composition of aloïne is represented by the formula.



which has been verified by the analysis of a bromated compound, consisting of



To obtain this bromated compound, which crystallizes more readily than pure aloïne, M. Stenhouse adds bromine to a cold aqueous solution of aloïne. It forms instantly a yellow precipitate which increases by repose, while the supernatant liquid assumes a very acid reaction, consequent upon the formation of hydrobromic acid. By dissolving the precipitate in warm alcohol, and cooling the solution, bromated aloïne is obtained in brilliant yellow needles,

grouped in stars. Chlorine appears to combine equally well with aloïne; but the chlorinated bodies are deprived of the power of crystallizing.

It has been long known in medicine that the aqueous extract of aloes is by far the most active part of the purgative; a fact easily accounted for, when we consider that aloïne, the real active principle of aloes, is soluble in cold water.

M. Stenhouse finishes his treatise, by suggesting that other species of aloes contain aloïne, and that the crystallization of this principle is alone prevented by the extractive matters associated with it, and which oxidise easily in contact with the air during the evaporation of the extract.—*Journal de Pharmacie, from Ann. der Chem. und Pharm.* lxxviii.

MEDICINE AND PHARMACY IN TURKEY.

By M. LANDERER, ATHENS.

In all the large towns of the Ottoman empire, especially at Constantinople, Smyrna, Thessalonica, and Prussa, there are very distinguished physicians. These practitioners are chiefly Greeks, Germans, Italians, and French, who, having studied abroad, have come to follow their profession in the East, where, twelve or fifteen years ago, the want of qualified physicians was much felt. It may be safely stated, without depreciating other medical men, that German doctors and those who have studied in Germany, enjoy throughout the East the greatest reputation, and obtain a preference over all others. In the provinces and in the army, physicians of scientific education are rarely found, and the practice is confined to empirics, who have previously been Pharmaciens. Many of them have originally been employed by scientific physicians, and have become suddenly *hekims* (the name of Turkish physicians.) Although most of them do more harm than good, yet there are some who, in the course of years, have acquired practical knowledge, and perform real service to sufferers. These *hekims* are also Pharmaciens, and furnish the medicines themselves

always, however, with the consent of the patients and their relations. In proportion as the disorder appears likely to require more or less treatment, they require for a complete cure one, two, or as much as ten thousand piastres.* As soon as the contract is made, a third of the amount is paid in advance ; when the patient is in a state of convalescence the second third, and the remainder when the cure is effected. If the patient happen to die during the treatment, the doctor receives nothing beyond the amount which had been paid in advance. Besides the above fees, which are considerable, the *hekins* receive from persons of high rank remarkable presents, consisting of horses, pipes ornamented with amber, worth sometimes from 6000 to 10,000 piastres, diamond rings, precious stones, &c. At the same time the persons attached to the Physician, whether as Surgeon or Pharmacien, obtain presents of less value, although not unimportant. If a *hekin* has succeeded in curing a distinguished personage his fortune is made, and he acquires the name of *hekin padischa* (first physician.)

Another class of doctors are the Surgeons (*gerrahs*,) and also the barbers (*berber*,) who, in the absence of physicians, perform the functions of *hekins*. They are found in their shops, where they attend patients, who receive the medicine on the spot. They also perform the minor surgical operations, sometimes in sight, to attract the notice of passers-by, and the most ordinary operation is then vaunted by the friends of the *gerrahs*, and by persons hired for the purpose, as an operation full of danger. In these shops or magazines, are kept, in old boxes not labelled, the medicinal substances most in use, such as sulphur, amber, sarsaparilla, corrosive sublimate, jalap, and tartar emetic. Serpents are suspended in the middle of the shop, or placed near the windows in glass jars. Patients can either purchase or borrow leeches and syringes.

As a third class of doctors we may mention the *kombojanites*, charlatans of the first order. They are met with especially in Asia Minor, Epirus, Macedonia, and Thessalia. They are criers at fairs, selling at stalls a number of remedies for divers diseases, and inventing all kinds of expedients to convince the credulous public of the efficacy of their specifics.

In Turkey, up to the present day, no law exists prohibiting foreign doctors from establishing themselves in any part of the

A piastre is about 1s. 8d.

empire, without the authority of the Government. Any person may practice medicine as he thinks proper.

As for Pharmacy, this profession is in Turkey in the most deplorable condition. It is only in the first towns in the empire, and principally in Constantinople and Smyrna, that there are among a crowd of wretchedly bad Pharmaceutical establishments, a few which may be compared to those of Italy and France. Moreover, those who keep shops are many of them French, but the majority are Italians and Greeks. The shops of the latter are in much better condition than those of the Italians. The most detestable of all, and which scarcely deserves the name of "Pharmacies," are those kept by Armenians, Jews, and the Turks themselves. In the town of Constantinople, properly so-called, or the town of Byzance, the number of these small shops, where five or six persons can scarcely move, amounts to several hundreds. All their supply of medicines consists of about fifty or sixty different kinds, enclosed in boxes, in large glass jars of different sizes, and in small drawers. Most of these substances have no labels, from which circumstance the most unpardonable mistakes continually occur. In other shops, which are not much better furnished, are found an innumerable quantity of jars and boxes, either empty, or in which the same article is repeated five times or more under different names. Thus, in Constantinople, I have seen in the shop of a Jew of Salonica, *vitriolated tartar* contained in seven vases, and under seven different but synonymous terms: and on my inquiry whether these were not the same substance, I was told that each salt possessed a particular curative virtue, and required a distinct mode of preparation.

There are at Constantinople nearly 1200 *Pharmacies* of this description. About 300, resembling more or less those of Europe, are worthy of the name. The latter are in the districts of Galata, of Slavodronia, and in general in those parts of the town inhabited by Europeans. Even these establishments have their faults, and quackery triumphs. Few of these shops have what may be termed a laboratory; as rarely have they ware-houses or cellars. It is in the shop itself that all the medicinal substances are accumulated and prepared. The best arrangement observable in the Turkish shops, is that the medicines are enclosed in glass cases; by this means they are protected from the terrible dust which, in the sum-

mer months, pervades all the towns in the east. In addition, however, there are on stands or on the counter, large jars, containing colored liquors of all tints, vessels in which serpents and other reptiles are preserved, and near the shop, jars of oil, retorts, Wolf's bottles, and other apparatus exposed to public view. Near the windows are placed large glass cylinders filled with blue vitriol, cut sarsaparilla, symrax, cinchona bark, crystals of tartaric acid, vases and stands on which are small caustic balls strung together like beads, bougies, syringes, &c.

All the chemical products are obtained from the great towns of Europe, and the compounds prepared are chiefly plasters and the most ordinary ointments. As neither a Pharmacopœia nor price lists exist in Turkey, each Pharmacien prepares and sells his medicines as he thinks fit, and according to the greater or less percentage which he gives to the doctor who sends him prescriptions. This percentage ranges from twenty to fifty. From this, some idea may be formed of the precarious position of a Pharmacien who depends upon the small profit he derives from retail business, or the preparation of a few prescriptions which are brought to him either by mistake, or by the particular favor of the patients. This abuse exists chiefly in Smyrna. There the Pharmacien would not venture to prepare any prescriptions but those emanating from the physician attached to his establishment, without exposing himself to great annoyance.

With regard to the personal qualifications of the Pharmacien, he is almost entirely destitute of scientific education. This glaring defect arises from the indifference of the Government, which does not oblige the Pharmacien to obtain a diploma as an evidence of his qualification. Hence it is a common occurrence, that the assistants or employees of the physician finish by establishing themselves as Pharmaciens. Among the numerous Pharmaciens at Constantinople, scarcely ten or twelve can be found who have gone through any scientific study in a university.

Many years ago, the Government established at Constantinople a school of medicine, where young Turks received instruction from distinguished Physicians educated in France, Italy or Germany. However, up to the present time, the results of this institution are no subject for congratulation, notwithstanding the great expense of its maintenance.

An abuse tolerated by authority, and which seriously injures the Pharmaciens, is the sale by merchants of every description of medicine, not only by wholesale, but even in single doses, and at a very low price, from which it follows that most of the Turks and Armenians in cases of small importance, never apply to a Physician, but always go to these Druggists for some simple remedy, such as senna, cassia, tamarinds, &c., of which the vender himself makes a decoction if the patient desire it.

Among the medicinal substances also found in these bazaars, I may mention different conserves of roses, of cedar, of orange flowers mixed with strong aromatics, such as cloves, ginger, amber, and musk, which electuaries are considered by the Turks as universal panaceas; syrup of alkermes, Leroy's mixture, antisymphilitic syrup, sarsaparilla, sassafras, pistachios, almonds of the *pinus cembra*, nuts, opium, many narcotic tinctures, bad preparations of cannabis, &c., &c.

The weights used by the Turks are *okas* ($2\frac{1}{2}$ lbs.) and *drachms*: for measuring liquors in drops, grains of corn are used. The inaccuracy of this measurement is obvious, as some Pharmaciens for the sake of gain, purposely select the smallest grains possible. As Pharmaciens are not obliged to prepare their medicines by any dispensatory published by authority, each has his own process. It follows that the same medicine obtained at different shops, is entirely different in its medicinal properties.

This is an outline of the state of Pharmacy and Medicine in the principal towns of Turkey, and the further you advance into Asia Minor, the more does this merge into empiricism, and the practice of medicine is found in the hands of ignorant and grasping quacks, whose only desire is to obtain money and to sell for 200 or 300 piastres the most insignificant remedy, by making the credulous consumers believe that it is prepared with gold or precious stones. Sometimes, in the presence of the purchasers, to induce a belief in their statements, they throw gold and precious stones into a colored and acidulated liquid, which is to form the desired remedy. A friend of mine, quite worthy of belief, who resided several years in the interior of Asia Minor, assured me that he had seen a *kombojanite* physician, who was instructed to prepare for a pacha a remedy for a jaundice, throw thirty ducats, a quantity of pearls and jewellery, in a red liquor to dissolve them. The liquor was evapo-

rated, and a medicine was thus formed having an acid and bitter flavor, for which the pacha paid 500 piastres.—*London Pharmaceutical Journal*, November, 1850, from *Archiv der Pharmacie*, and *Journal de Pharmacie d'Anvers*.

NOTE UPON SOPHISTICATED OIL OF WORMWOOD.

By B. W. BULL.

Specific gravity, Pereira, .972. Löwig, .973. Brisson, .9703. Brandes, .9725.

The essential oil obtained by distillation from the *Artemisia Absinthium* does not seem to have received much attention from chemists, and its properties are accordingly imperfectly understood. Löwig says that "at 180° C. it enters into ebullition, between 200°-205°, the boiling point remains constant for some time, but finally rises, while the residue generally becomes thick in the retort.

The sample in question was part of a large lot obtained from Boston; the odor and general appearance indicated an article of superior quality, but its specific gravity, .920, led to the suspicion that it contained some admixture of foreign substances. A portion of it subjected to distillation in a sand-bath, entered into an active ebullition at 85° C.—185° F., while a copious distillate appeared in the receiver. The thermometer rose slowly to 198° F., the quantity gradually diminished until the latter point was reached, when it ceased altogether. At about this temperature the liquid ceased boiling, and the thermometer rose steadily to 200° C.—392° F., when ebullition again commenced. Between these two latter temperatures nothing came over. The distillate was limpid, colorless, and possessed a saccharine pungent flavor, somewhat masked by the characteristic aromatic taste of wormwood.

In order to ascertain the amount of foreign volatile matter present, a second portion, weighing 2,187 grains was subjected to distillation from a suitable vessel. The same phenomena were observed, and the residue, after the operation was finished, weighed 1,331 grains, indicating a loss by the process of 856 grains, or a trifle over 39 per cent.

The distillate in this case was, however, somewhat colored by a portion of the oil, which had been mechanically carried over during the operation. Its specific gravity at 66° was 874. It was inflammable, burning with a white flame slightly tinged with green. The saccharine flavor mentioned above was very perceptible, suggesting at once the presence of chloroform.

The residue of undistilled oil possessed a thick, syrupy consistence, as might have been expected after parting with so large a proportion of its substance. Its color was somewhat darkened by the action of the heat, but its flavor was very slightly, if at all affected. Specific gravity at 66° , 949.

The distillate obtained by this operation, amounting to nearly two fluid ounces, was re-distilled carefully from a water bath. It commenced coming over at 167° F., the largest portion came over between 173° and 176° , and the remainder at a temperature not exceeding 178° , leaving in the retort a trifling residue, consisting of the oil mechanically carried over during the previous operation. The first half was received in a separate vessel. Its specific gravity at 70° was 889, it possessed in a high degree the saccharine flavor above mentioned, though still somewhat concealed by the flavor of wormwood.

The last portion was almost entirely free from any flavor of chloroform, and consisted of alcohol, somewhat modified in taste by a slight flavor of wormwood. Its specific gravity at 70° was 832.

It will be observed that the opposite gravity of the last portion which came over at the higher temperature, was lower than that of the first, owing to the fact that the chloroform passed over first, as was to have been expected, from its lower boiling point, and from distillation having been carried on slowly for this purpose.

The above experiments were considered sufficient evidence to prove that this sample, purporting to be Oil of Wormwood, had been adulterated to the amount of nearly 40 per cent. with volatile matter, consisting of chloroform and alcohol, or with a mixture of the so-called chloric ether and alcohol. It is quite immaterial in which of the above forms these substances were introduced, as the result is of course the same in both cases. It was not considered necessary, in order to complete the proof, to separate the chloro-

form from its solution in alcohol, which might easily have been done, since the amount of oil examined yielded a quantity quite sufficient for the purpose.

The undistilled residuum was next examined. Its specific gravity at 66° was 949, only. It left a fixed stain upon paper, which (as it was perfectly soluble in 80° alcohol) was probably owing to a further admixture of resinous substances. An addition of this kind would very naturally suggest itself, to correct the limpidity occasioned by such a copious admixture of diluents.

Since the above examination was made, another sample of the same substance from a similar source, was found to contain an adulteration to the extent of nearly 70 per cent., consisting mainly of oil of turpentine. Its specific gravity was 902.—*New York Register of Medicine and Pharmacy*, April 1, 1851

MANUFACTURE OF SULPHATE OF COPPER.

The commercial manufacture of sulphate of copper, and the apparatus employed, is very simple. In a wooden vessel lined with stout sheet-lead, a certain quantity of oil of vitriol is introduced, to which copper-scales are added, until a saturated solution of sulphate of copper is obtained, the operation being assisted by the aid of steam, blown in through a lead pipe dipping to the bottom of vessel; the mother-liquor of a previous operation is then added, and the whole set aside to crystallize. The crystallizing vessels are of wood lined with lead. These are placed in a warm room, and a crop of crystals is usually obtained in the course of four or six days. The mother-liquor being poured off, the crystals are placed in the drainer, after which they are dried, and packed in casks for sale; or, what is of more frequent occurrence, taken from the drainer whilst still damp, and in that state packed for sale.

The copper-scales above mentioned consist of a mixture of metallic copper with oxides of that metal, and are obtained in the form of thin plates or scales from the sheets of copper which have undergone the process of annealing, by being heated in a furnace or forge. A portion only of these scales are dissolved by the sulphuric acid; the residue is therefore washed, dried, and sent to

the copper furnace to be melted. The following shows the result of two operations on the commercial scale.

First Operation.—5 cwt. 2 qrs. of copper scales, 685 lbs. of sulphuric acid, sp. grav. 1700, and a sufficient quantity of water, produced 5 cwt. 2 qrs. 24 lbs. of crystallized sulphate of copper; also 122 gallons of mother-liquor, sp. gr. 1180, and 160 gallons of ditto, sp. gr. 1100. A certain quantity of sulphate having been obtained from a given number of gallons of each of the mother-liquors, the total produce of sulphate of copper was estimated at 1240 lbs. 2 cwt. 1 qr. 8 lbs. of insoluble copper remaining.

Second Operation.—Copper scales 7 cwt., sulphuric acid, sp. gr. 1700, 800 lbs., water, q. s., produced crystallized sulphate of copper, 7 cwt. 1 qr. 14 lbs.; 138 gallons of mother-liquor, sp. gr. 1176, and 116 gallons, sp. gr. 1080, total crystallized sulphate of copper was estimated (in the same manner as in the first operation) at 1651 lbs.; the quantity of insoluble copper residue being 2 cwt. 3 qrs. 18 lbs. In these experiments, water was used instead of the mother-liquor of a previous operation, the object being to ascertain the exact amount of salt obtained from a certain quantity of copper scales.

A not unfrequent custom in the manufacture of sulphate of copper is the addition of the "pickle," or "dipping-liquor" of the coppersmith and brazier, to the solution of copper in sulphuric acid above-mentioned, and in some cases the pickle or dipping-liquor alone is employed to furnish crystals of this salt, the excess of acid being neutralized with oxide of copper.

The pickling or dipping process consists in the immersion of copper, brass, and other metallic alloys in an acid solution, for the purpose of removing the film of oxide with which the metal has become covered, and which oxide must be removed in order to render the metallic surface sufficiently clean for the reception of varnish, lacquer, or other finishing, as well as also for the coating of the surface of one metal with another.*

There could be no objection to the use of this pickle or dipping-liquor, if copper articles alone were immersed in the acid; but as

* In the tin-plate works, large quantities of sulphate of iron are obtained by the evaporation of the pickle in which the iron plates are dipped for the purpose of cleansing them, previous to their immersion in the bath of melted tin.

articles formed of brass and other metallic alloys are also dipped in the same pickle, the sulphate of copper thus obtained cannot be pure. Again, a mixture of nitric and sulphuric acid is sometimes employed, constituting another source of impurity.

In Birmingham, some hundred tons of dipping-liquor are annually made, and employed in the manufacture of sulphate of copper; the consequence being that the sulphate contains a large portion of zinc, which may sometimes be seen in the form of slender white needles on the surface of the dark blue crystals. Nickel, lead, arsenic, and antimony are sometimes present in the so-called sulphate of copper, manufactured either partly or entirely from the pickle or dipping-solution.

In addition to its medicinal uses, this salt is extensively applied in the arts, particularly in the manufacture of Scheele's or emerald green, and other pigments. Large quantities of sulphate of copper are also disposed of in the autumn and spring in the agricultural districts, it having been found that seed-corn steeped in a solution of this salt previous to being sown, is an effectual remedy against the disease of wheat called the "smut."

The impure sulphate of copper before mentioned, which is sold at 4s. to 5s. per cwt. below the price of good sulphate, will do very well for agricultural purposes, but as sulphate of zinc is not equally efficient for preventing the smut, the farmer must employ a larger quantity of the impure salt to effect the desired purpose, and thus gains nothing from its use. The *very impure* sulphate of copper is of a much lighter colour than the genuine salt. Sulphate of copper from sources likely to be dashed with the contents of the pickling or dipping-pot, should at all times be viewed with much suspicion.—*Pharm. Journal and Transactions*, April 1851.

ON THE MILKY JUICE OF THE LETTUCE AND THE POPPY.

BY AUBERGIER.

Aubergier cultivated *Lactuca sativa* and the poppy on the large scale in order to obtain lactucarium and opium. In lactucarium he found *lactucin*, *mannite*, *resin*, *cerin*, *asparamid*, a brown color-

ing substance, *oxalic acid*, and *various salts*. In the year 1844, he sent fifty kilogrammes of solid lactucarium procured by himself to the exhibition at Paris.

The poppies were cultivated in rows, and the capsules cut as soon as they were perfectly developed. The collected juice was daily dried in the sun. On examining the various samples, Auberger obtained the following results:—

KIND OF POPPIES.	Period of Gathering.	Weight of the Opium after being dried <i>in vacuo</i> at 212° F.	Loss in Water.	Morphia obtained from 25 Grains of Opium.	Quantity of Morphia calculated from 100 parts of Opium, containing 7.60 per cent of Water. The Normal Quantity according to Payen.
1844.					
Opium from the white poppy	July 5, 11	90.52	9.48	2.100	8.570 ₁₅
Ditto	" 17, 20	92.53	7.67	0.380	1.520 ₁₆
Opium from the purple-red poppy . .	" 10, 13	90.61	9.39	2.640	10.690
1845					
Opium from the white poppy	July 2	88.42	11.58	1.588	6.630
Ditto	" 28	88.55	11.45	1.329	5.530
Ditto	Aug. 13	89.02	10.98	0.777	3.270
Opium from the purple-red poppy . .	July 21	88.40	11.60	2.659	10.370
Ditto	" 26	87.09	12.91	2.517	10.694
Ditto	" 16	89.05	10.95	2.919	11.230
Opium from the oil-poppy (<i>Pavot oeil-lettés</i>)	" 29, 30	88.29	11.71	4.260	17.833
Ditto	Aug. 21	86.69	13.31	3.482	14.780

This table shows that the first crop of 1844 contained more morphia than of 1845, and the reason is, that in the first case, round poppy heads were cultivated together with long ones, which latter contained more alkaloid. The decrease in the proportion of morphia in the three crops of the white poppies in 1845, is in consequence of the advanced ripeness, and the statement that the collection should be commenced when the green color is beginning to change into yellow, cannot therefore be correct.

If the incision be made into the external part only of the pericarp, the seeds ripen, and oil may be manufactured from them, but if the incision be made quite through the pericarp, the ripening of

the seeds is stopped. The white poppy with black seeds (*parot a oeillette*) has so thin a pericarp, that by the incision the seeds are lost, but the opium obtained therefrom contains the largest proportion of morphia.

With regard to the cultivation of opium in France, Aubergier further observes, that the expenses incurred by the collection do not exceed the fourth part of the value of the crop, and if the seeds can be saved, their price will cover the rent and all other expenses. Six laborers gathered in 1846 at Clermont, 2,730 kilogrammes of milky juice=682 grammes, or twenty-two ounces and seven-tenths of dry opium. The quality of the opium depends on the species of poppy, and in the same variety of poppy, on the more or less advanced maturity of the fruit when the opium is gathered. The climate has no influence upon the quality of the opium and on the quantity of morphia obtained from opium cultivated in France and in Algiers.—*Pharmaceutical Journal*, May 1, from *Central Blatt*, Dec. 1850, p. 846.

MITCHAM: ITS PHYSIC GARDENERS AND MEDICINAL PLANTS.

PEPPERMINT, ITS CULTIVATION AND PRODUCE.

(Continued from page 150.)

Land intended for peppermint, should be of a rich friable soil, rather moist, but not stagnant. If poor, it should have about twenty tons of manure to the acre, nor less than twelve if previously dressed; if more, the plant is apt to go to leaf at the expense of the oil. This should be ploughed under ten inches deep in the surface, in the beginning of winter, for although the stolons run upon the surface, the main roots descend deep in the soil, and this proceeding is requisite to keep the plants in a growing state during the hot part of summer. At the latter end of March, the furrow ridges are harrowed down to make the ground level for the planters, who proceed with an instrument resembling a rake, having four large projecting teeth set to the distance the rows are intended to be apart, which is from four to eight; when eight they are one foot apart; when only four, they are eighteen inches apart, and the plants one foot apart in the rows, and between every bed

two rows are missed or left out for the allies the following year. The described tool is drawn up and down the land, marking the true position of the rows; the first year the allies are not thrown out. The planting is begun when the plants are about four or five inches high, according to the season, which is in April. The plants are the skimmings of old beds where they rise above four or five stems, or from old beds intended to be destroyed, or are purchased by the bushel. They vary very much in price, according to the previous season; about five shillings commonly, but sometimes from three shillings to twenty shillings. Although last winter was mild, they were very scarce, owing to the previous dry summer, which killed many of the old plants. The older the plants, the more oil they produce, in proportion to the bulk of stems. The first year the beds require hoeing five or six times, at an expense of six shillings per acre. The second year, at the approach of winter, the allies are thrown out to cover the mint, about two inches deep, for which the men are paid eighteen shillings per acre; if manured, three shillings more for spreading. The soil lays rough until the beginning of March, when it is harrowed down with light harrows, after which the beds are thinned for future beds, leaving about four or five to each stole, according to strength. Then follows dotting; that is, a man going over the beds, and pecking out the weeds with the corner of a hoe, and throwing them into the allies. For this he is paid four shillings per acre. From this time, until the mint is fit to cut, it is hoed about four times, at six shillings per acre. I omitted to say that the first planting cost twenty-one shillings per acre for labor. The third year is the same as the second, but the allies then becoming so deep and wide, occasion such an encroachment on the beds, that they are destroyed for other crops, but are frequently ploughed in for future plants the next spring, when they are entirely destroyed. Cutting begins when the mint is well in flower. The men are paid twelve shillings per acre for cutting. Their business is to cut the plant and lay it in Prussian mats (which are less than the Russian) in bundles weighing 1 cwt. each, in which, if the weather be wet, it is skewered up and taken to the still at once, as the rain occasions a great loss of oil. But should the weather be favorable, it is dried in the field, for reasons to be explained.

The stills commonly hold a ton; that is, twenty bundles of green

mint, but when dried, thirty. When stills are hired, they charge twenty-one shillings per still, or once filling, which makes it advantageous to the grower. Green mint will run off three-and-a-half pounds on the average, and dry mint from four to five pounds. An acre of mint produces about five tons; that is, from four to six, as seasons produce great variations, both in plant and oil. *Spearmint* is treated in a similar way to peppermint, but the plant being stronger, requires more room. It is but little grown here, and that for culinary purposes.

Diseases of the Mints.

The greatest detriment to mints is termed the smut or parasitical fungi, of which there are three species, very troublesome, but more so in dry summers, which occasion the plants to get rusty and lose their leaf, diminishing the bulk very much. The worst is *Æcidium menthæ*, which spreads over the whole plant. It is of a dull yellow color, and attacks the plant just before it flowers. The next is *Uredo Labiatarum*. This attacks the under side of the leaf, and is frequently mixed with the former. It is of a light brown color. A third species, *Puccinia menthæ*, attacks the plant in spring, and frequently disappears before the others are seen. The under part of the plant being covered with minute black spots, especially in wet seasons. Other fungi of a higher order, are parasitical on the stems after cutting, and probably arise from decay.

The mints or other medicinal plants grown in this parish, are on a small scale, many growers not having above half an acre, and of lavender about the same: the above are the principal herbs grown here; besides two or three small general growers, who supply Covent Garden.

About fifty acres of mint, and fifty of lavender, are grown at Carshalton.

*Lavendula latifolia** has been grown here, and seeds very freely, but is not held in very high estimation.—*Pharmaceutical Journal and Transactions* Jan. 1851.

* *Lavendula latifolia* is the *L. spica* of De Candolle.—ED. PIER. J.

ON THE PREPARATION OF VEGETABLE ALKALOIDS.

BY MR. JOHN S. COBB,

I wish to call the attention of this meeting to a peculiar process for the preparation of the vegetable alkaloids. This process, remarkable as well for its simplicity as for the advantage with which it may be applied to the preparation of small quantities of these salts, is based upon the property which charcoal possesses, in common with some other substances, of extracting and retaining certain principles from the liquids with which it is placed in contact. The credit of its application to the above purpose is due to M. Lebourdais. That gentleman had undertaken some experiments in order to demonstrate the pre-existence of the vegetable alkalies in plants, and for that purpose was endeavouring to discover some more direct mode of extracting these salts than the one commonly employed. Having poured into a phial containing some charcoal an aqueous solution of extract of digitalis (previously precipitated by acetate of lead) and shaken the bottle, he was surprised on finding, when the charcoal had subsided, that not only had the liquid become colorless, but also it had entirely lost its bitter taste. It immediately occurred to M. L. that the charcoal, under the influence of some other solvent, would cede again the bitter principle which it had extracted from the liquid. He, therefore, washed and dried the charcoal and treated it with boiling alcohol, which became slightly colored, and charged with all the bitter principle.

Evaporated in a water-bath this left for residue an amber-colored liquid, which, by repose and refrigeration, deposited a pulverulent matter. This, separated by filtration, washed, and dissolved in alcohol, gave, by spontaneous evaporation crystals of digitaline.

Having thus ascertained the practicability of the process in reference to digitaline, M. L. proceeded to test its applicability to the extraction of the alkaloids of other plants, varying somewhat the manipulation according to the substance operated upon.

Thus he obtained scillitine in the same manner as digitaline, while to procure illicine, he boiled a decoction of the leaves of the *ilex aquifolium* with charcoal, and then washed, dried, and treated as previously the charcoal.

For the preparation of columbine, strychine, and colocynthine, he operated as follows:

Having deposited in the part of a funnel a layer of well-washed charcoal, he placed the respective substances (previously moistened) upon it, and, by percolation with water, exhausted them of their active principles, which, however, were ceded by the water in passing through the stratum of charcoal. The charcoal was then treated as previously described, and the alcohol yielded, by spontaneous evaporation, crystals of the respective bases.

A remarkable property connected with the last-mentioned bases is, that by a long-continued stream of water they may be redissolved from out the charcoal which had absorbed them, and this solution being filtered through charcoal, they again combine with the latter substance. M. L. did not find this to be the case with any other of the bases which he examined.

By similar manipulation to the above was obtained an alkaloid which was the subject of an interesting paper from Mr. Bastick at the last meeting, but which, I think, that gentleman is mistaken in supposing to be a *new base*; for so long ago as 1848, M. Lebourdais published an account of arnicina, which he described as "a substance having the aspect and consistence of Venice-turpentine, slightly soluble in water, but the small quantity dissolved communicating to it nevertheless a bitter taste: soluble in all proportions in alcohol; and this solution, by spontaneous evaporation under various circumstances, invariably leaving a residue having the aspect and consistence above described."

In a series of experiments which I made shortly after the publication of M. L.'s process, I found that as a general rule the alkaloids of those substances not containing much colouring matter may be most conveniently prepared by the simple percolation through charcoal, &c.; while those rich in colouring matter require previous precipitation by acetate of lead, excepting of course those substances (as the arnica) whose base is precipitated by this salt. I also found some slight variation of the above process necessary for obtaining certain of the alkaloids in a crystallized form. Thus, in the preparation of atropine, I found it necessary to add a small quantity of water to the alcohol, and to evaporate only till the liquid assumed a milky appearance; with this slight variation, however, I obtained atropine by the above process with compara-

tive facility, though I confess that the quantity was small, lbj. of the root yielding me but about eight grains of the base. This I attribute, however, to not being able to procure the root in a good state of preservation.

I have also obtained rhabarbine by this process, and as I believe the notices of this substance at present published are rather vague, perhaps I shall not be trespassing too much on your time in giving a short account of it.

It is of a yellow colour, and by the aid of the microscope, is seen to consist of long prismatic crystals; it is fusible at a gentle heat, at a higher temperature, in part subliming in the form of a yellow powder, in part decomposing to a black mass: it is soluble in ether and in boiling alcohol, and insoluble in solutions of the caustic alkalies, which do *not* redden it.

I do not consider the substance obtained by the process to be the rhabarberic acid of Brande's, for that is reddened by the alkalies, and also would appear to be eliminated in the first part of the process, since it is precipitated by acetate of lead; I consider it rather to be the "rhein" of Dulk, which he states to be the real principle of rhubarb, and to become rhabarberic acid by oxidation.

Now, on the supposition that such is the case, it becomes a point of some interest in Pharmacy to determine whether the precipitate occurring in tincture of rhubarb may not be caused by the oxidation of its active principle, and how far the tincture may be deteriorated by such circumstances.

The CHAIRMAN, in reference to the allusion made in Mr. Cobb's paper to the elimination of the active principle of rhubarb, said, that a good test for distinguishing Russian from East Indian rhubarb was much wanted, and suggested that probably the process described by Mr. Cobb might be applied for the purpose.—*Pharmaceutical Journal and Transactions*, March 1851.

ON EXTRACT OF HENBANE.

BY MR. CHARLES CRACKNELL.

(From the Transactions of the Pharmaceutical Society, London.)

I have selected extract of henbane for my subject this evening, not only on account of its being one of the most useful and most powerful extracts prepared from any indigenous plant, but because it elucidates what I am about to state, and exhibits the differences I am about to describe in a more marked degree than any other extract, and consequently requires the greatest amount of care in the preparation of it.

In order to render myself as clearly understood as possible, I shall speak separately of the three most important circumstances to be attended to in the making of the extract.

Firstly.—The selection of the herb.

Secondly.—The expression and evaporation of the juice.

Thirdly.—The result.

First then the selection of the herb—and this is manifestly a very important division of my subject, for a good product is not likely to be obtained from a bad or unfit material—yet, notwithstanding its importance, it is the very thing least attended to. Our *Pharmacopœia* (I hope soon to have the pleasure of saying our *late Pharmacopœia*) gives a license for gathering the plant which I cannot but think quite unjustifiable, and which defies at least all uniformity of result, and most writers on the subject confine themselves to the manufacture of the extract. For reasons to be presently stated, I believe that henbane is only in a fit state for extract during a very short period, that is to say, when the flowers at the summits of the plants and its branches are blown, but before they show any symptom of fading. If the plants have been carefully gathered and sent to London, and have not grown amongst high weeds, the leaves will then be green to the bottom of the central stem, the seed vessels and seeds which are formed will be soft and juicy, and the weight of the plant will reside in the leaves and stems: if it be allowed to stand a little longer the lower leaves become more or less yellow—the seed vessels, particularly the lower ones, become hard and prickly—the seeds assume a brownish color, and on holding the plant by the lower part of the

stem, it will be perceived that the weight then resides chiefly in the top. Of the immature plant but little is met with in the market: a description of it is obviously impossible, as I should call it too young at any period before the one first mentioned; the extract yielded by it I shall describe presently. Much has been said at various times about the relative strength of the extracts made from annual and biennial *hyoscyamus*, and I believe that the opinion is gaining ground that they may be used indiscriminately. It is not my intention to dwell upon this part of the subject now, but I may remark in passing that the physical characters of the two plants and their extracts differ considerably, and in the absence of proof, I have no hesitation in deciding in favor of the biennial—such then is the plant I always use, and to which my present remarks refer.

I now come to the preparation of the extract. The market bundles, which are always more or less heated, should be opened immediately they are received, and the herb spread in a cool place; the leaves, flowers, soft stalks, and seed vessels should then be stripped from the large hard stalks as quickly as possible, ground in a mill (without being sprinkled with water as directed by the *Pharmacopœia*, as there is already more of that ingredient than the careful operator desires) and the juice expressed, strained through some coarse material, and conveyed to the evaporating pans. I may here remark, that the practiced eye can predict the quality and character of the extract by looking at the juice. The juice yielded by the immature plant is of a bright grass green color; that by the plant of proper age is of a deep dull green color, such as would be produced by a certain mixture of brown and green; and that by the plant when too old is of a brown color, with some green coloring-matter floating in it, which speedily settles to the bottom. In a valuable paper read in this room on the 13th of November, the process of evaporation was so ably discussed that little remains to be said on the subject. I believe the best methods, and which are always at command, to be a water-bath, or the passing a current of warm air over the surface of the juice. Among the advantages of this latter process stated by Mr. Archer, there is, however, one with which I beg to differ; he says, "The evaporating liquid requires no stirring, or other attention, from

the commencement to the conclusion of the process." Now in practice, I find, that an inferior extract (not of course in strength, but in other qualities which I think very essential) is obtained by leaving the juice to itself to that which results from constantly stirring it; stirring accelerates the evaporation, and produces an extract more convenient for the use of the dispenser, inasmuch as it is less adhesive, and can consequently be weighed in small quantities with much greater facility and dispatch.

I now come to the last division of my subject—the result; the quality of which must, in a great measure, depend on the efficiency with which the two first have been conducted. Strength, doubtless, is one of the most important properties of the extract, but there are other qualities not less important, and which I think should never be sacrificed for obtaining a slight increase of it—such are durability and convenience; and to procuring these in combination with a strength which (although by certain processes it might be exceeded) I have never found equalled in the extracts of commerce, I now wish particularly to draw attention; the most important proceeding for obtaining such a product is the selection of the plant; there is only one time when it will yield it, which is the time already mentioned, and then the albumen and the deliquescent salts of the juice are so nicely balanced, and the product yielded so unexceptionable, that we may fairly look upon it as one of those wise arrangements of Providence which adapts everything to the use and benefit of man. If the plant be gathered too young, it will yield an extract not only deficient in strength, but possessing neither of the other necessary qualities—it is of a crumbly nature, dries very rapidly, becomes fetid and mouldy, and in a very short time totally unfit for use. If the plant be too old, it will yield an extract, very strong I believe, but void of durability and convenience, for it soon becomes fetid, which indicates change, and is very deliquescent, which is extremely inconvenient. The same may be said of extracts from which the albumen has been separated, a process which I do not think advisable under any circumstances, for I found the extracts made from the flowering plants of the very rainy season of 1843, keep exceedingly well for one year; some of them I kept more; in fact there is on the table some extract of hemlock which was then put into the same pot in which

it now is, and has been purposely kept without being moved or meddled with. It has lost the fine green color which it once possessed, but on dissolving a few grains in liq. potassæ last evening, and comparing it with a similar solution of last year's extract, I could not perceive any difference in the strength. I believe that if the herbs were well dried and carefully kept for twelve months, they would then yield, by treating with water, an extract much stronger than any that can be made from the green plant, but such extracts do not keep well, and are very deliquescent. Great strength then is not the only requisite of a good extract; it matters little to prescriber or patient whether four or five grains be ordered or taken, but it is very inconvenient to both dispenser and patient to have a box of pills in less than a week becoming soft, and running into a mass, which must be the case unless some dry powder be used in making them, which of course does away with the advantage of the additional strength: it is moreover very important that extracts should be of the same strength at one time of the year as at another, and such they cannot be unless they be made with every precaution to prevent change. Besides the extract of hemlock, already mentioned, there are on the table three samples of extracts of henbane, made in the month of June, 1848, '49, and '50, which have been kept in pots merely tied over with brown paper, and have undergone no change worthy of notice, and this is the best proof I can give of the value of the process I have been describing.

Mr. Bell agreed with the author of the paper in considering that the biennial plant yields a better extract than the annual. He believed, however, that the annual plant was very generally used in consequence of its yielding a larger quantity of extract than the biennial.

The Chairman corroborated Mr. Bell's statement, in reference to the relative quantities of extract obtained from the two varieties of henbane. He observed, with reference to the preservation of the extract, that the length of time during which it might be kept depended very much on the extent to which it was exposed to the air. Turning it from one pot to another would cause it to spoil sooner, by exposing a fresh surface.

Mr. Cracknell said he had no doubt that the extract made from the biennial plant was better than that made from the annual yet some botanists assert that there is no difference in the plants.—*London Pharmaceutical Journal*, March 1851.

ON THE TESTING OF CINCHONAS BY MEANS OF CHLOROFORM.

By M. RABOURDIN.

I shall endeavor to show, in the following paper, the means by which we may estimate the alkaloids in cinchonas, by applying the property which chloroform possesses of dissolving these bodies when contained in an aqueous liquid.

Test of Grey Cinchonas—Ten drachms of the grey cinchona bark of commerce, powdered and passed through a fine horse-hair sieve, is to be moistened with a sufficient quantity of water acidulated by hydrochloric acid (five drachms of acid to $2\frac{1}{2}$ lbs. of water,) and then packed in a displacement apparatus. A sheet of filtering paper is placed over it, and the powder treated with the acidulated water, which is continued until the liquor which passes through becomes almost colorless, and devoid of bitter flavor, (when the powder is uniformly and properly packed, it becomes exhausted when about six or seven ounces of liquid have been passed through it; $1\frac{1}{2}$ drachms of caustic potash, and $7\frac{1}{2}$ drachms of chloroform, are added to the liquor, which is to be quickly agitated for a few moments, and then allowed to settle. After a short time, never exceeding half an hour, the chloroform subsides to the bottom, carrying the whole of the cinchonine with it. The red and transparent liquid floating on the top of the deposit is to be poured off, care being taken not to remove any of the latter; water is to be added several times until the deposit is thoroughly washed; and then it is poured into a porcelain capsule. This matter is composed of a liquid portion, which is a solution of cinchonine, in chloroform, and of a semi-solid reddish portion, consisting of cinchonine, of chloroform in a state of emulsion, and of cinchonic red. The capsule is placed on a bath of boiling water, in order to evap-

orate the chloroform, and the residue is treated with water acidulated with hydrochloric acid, which dissolves the whole of the cinchonine and a portion of the cinchonic red. It is then to be filtered, and solution of ammonia diluted with fifteen or twenty times its volume of water added to it. This addition is made drop by drop, keeping it continually stirred; as soon as a white cloud appears which is not dispersed by the agitation, a sufficient quantity of the solution has been added. This part of the process effects the precipitation of the cinchonic red without touching the cinchonine. It is easy to determine when to terminate this part of the process, as the cinchonic red is precipitated in the form of reddish brown flakes, and the cinchonine, on the contrary, in white curdled flakes. When a sufficient quantity of dilute ammonia has been added, the liquor, which ought to be colorless, is filtered; the filter then washed with a little distilled water, and the united liquors precipitated by an excess of ammonia; the precipitate, which consists of pure cinchonine, whose chemical properties it is easy to determine, is then collected, dried, and weighed.

The first experiment yielded me 2.9 grains of cinchonine, and a second produced three grains. In taking the highest figure, we have 75 grains of alkaloid in 2lbs. 8oz. of grey cinchona.

Test of Yellow Cinchonas.—It is not necessary to operate on more than five drachms of the yellow cinchona bark, as the proportion of organic alkali in this variety of cinchona is much greater than that of the grey cinchona.

Five drachms of yellow cinchona, powdered, and passed through a fine horse-hair sieve, are to be exhausted with acidulated water, as in the case of the grey cinchona. The addition of the liquor is to be discontinued when it passes through colorless and insipid: we thus obtain from five to six ounces of liquid, to which $1\frac{1}{2}$ drachms of caustic potash and five drachms of chloroform are added. These are to be agitated for a short time, and afterwards allowed to subside; there is then a dense whitish deposit formed, consisting of quinine, cinchonine, and chloroform; sometimes the separation is complete and effected in an instant, leaving a red transparent liquid floating on the surface, which may be immediately poured off; the chloroformic solution is then washed, collected in a small capsule, and by the spontaneous evaporation of the chloroform, the alkaloids remain in a pure state.

I think it unnecessary to speak of the testing of the red cinchonas, as they resemble the yellow, of which I have just spoken, and all I have stated respecting the latter is applicable to them.—*London Pharm. Jour.*, March 1, 1851, from *Repertoire de Pharm.*

ON THE PREPARATION OF SMYRNA OPIUM.

BY M. LANDERER.

The so-called Smyrna opium is prepared in the interior of Asia Minor, and chiefly in Kara Chissar, and in the neighborhood of Magnesia.

The plantations are in the neighborhood of a few small houses, which contain copper-kettles fixed in the walls, casks and shelves for drying the opium-cakes. The exhalations emitted by these plantations, especially in the morning and after sunset, are described by the Turks as very dangerous, and they avoid them by retiring towards evening to their huts, which they do not leave till after the rising of the sun. The author has himself experienced the effects, which manifested themselves by giddiness, dejection and uneasiness. As soon as the moisture of the atmosphere (which in the East is proportionably greater than in other countries, and supplies the place of the rain) begins towards evening to be condensed, a strong narcotic smell is developed. This, in those unaccustomed to it, gives rise, in about a quarter of an hour, to headache and nausea. The plants, grown partly from white, partly from blue seeds, attain a height of six to eight feet; and the laborers engaged in making the incisions into the capsules are quite invisible when working in the plantations. The size of the poppy-heads differ considerably; but if they are intended to grow very large, for the purpose of obtaining a greater quantity of opium of the first quality, about half or three-quarters of the heads are cut off, by which the remainder often attain the size of a child's head. The capsules which have been cut off are dried, and from the seeds, which are called *chas chas*, the natives prepare oil, which is exported to France; they also make use of it for culinary

purposes, but dishes dressed with it are apt produce headache and inclination to vomit, especially if the oil has not been heated. By means of a fork-like instrument or a bent knife, incisions are made on the capsules, either parallel or crosswise, and these are repeated as long as the milky juice escapes. To prevent any portion of the abundantly flowing juice being lost, it is caught in small sea-mussel-shells (*Αχιβάδες*), dried in the sun, and kept separate as the best quality. The incisions are generally made before sunrise, and every evening the dried but still soft juice is gathered from the plants, with more or less of the epidermis, by which the quantity is increased. The capsules, which yield no more juice, are cut off, tied in bundles, dried in the sun, and opened with a small knife, in order to remove the seeds. Seeds obtained from capsules which have been used for the preparation of opium, if sown, yield an inferior opium; hence the seeds which are sown are those which have been obtained from poppies not used for producing opium. The next process is the boiling of the poppy plants. Having been cut down with sickles, they are tied up in bundles and sent to the laboratory; there the leaves are separated from the stalks, and placed in the kettle for boiling. When perfectly boiled, both leaves and stalks are spread out in the fields, and towards the end of September they are burnt and the ashes employed as manure, together with sheep and goat dung. The decoctions which have been obtained by the first boiling, are then, without previously being filtered, evaporated in separate copper-kettles to the consistency of a solid extract; but although the mass is constantly stirred with wooden spatules, this process is performed with great carelessness, and the extract is often burnt during the process. Before making it into cakes, a part of the opium obtained by incision (*Lacrymæ Opii*,) is added at discretion to the extract produced by boiling, and the whole kneaded, partly with the hands, partly with a sort of large spoon. It is then formed into cakes of different sizes, wrapped in fresh poppy-leaves, and placed on the shelves to dry. It is the opinion of experienced opium manufacturers, that the half-dried cakes of even very inferior quality are much improved, if exposed every morning and evening to the abundantly falling dew. The perfectly dried cakes are then pack-

ed in small boxes filled with poppy-leaves, and sent to the bazaars, where they are sold by *okkas* and *dramms*.—*Archiv der Pharmacie*, September, 1850, p. 293.

PROCESS FOR DETERMINING THE AMOUNT OF PRUSSIC ACID
IN THE MEDICINAL PRUSSIC ACID, BITTER ALMOND AND
CHERRY-LAUREL WATERS.

BY PROF. J. LIEBIG.

When a solution of caustic potash is added to a liquid containing prussic acid until it has a strong alkaline reaction, and a dilute solution of nitrate of silver is then slowly poured into it, a precipitate is formed, which on agitation immediately disappears again to a certain limit. When the prussic acid is mixed with a solution of caustic potash and a few drops of chloride of sodium, and then the solution of silver added, a certain proportion of the latter may be added as in the previous case before a permanent precipitate forms, which in this case is white chloride of silver.

The liquid containing prussic acid, when mixed with potash, contains cyanide of potassium, in which the oxide or chloride of silver are soluble, until the well-known double compound, consisting of equal equivalents of cyanide of potassium and cyanide of silver, is formed, and which is not decomposed by excess of potash. When, therefore, the amount of silver in the solution is known, and at the same time how much of it in volume or weight has been added to the alkaline liquid containing the prussic acid, until the formation of a precipitate, we can thence determine the amount of cyanogen or prussic acid in the liquid, for 1 equiv. of consumed silver exactly corresponds to 2 equivs. of prussic acid.

The following experiments by Dr. Fleitmann will show the accuracy of the method. In the first place, the amount of prussic acid in a very dilute solution was determined directly by precipitation with nitrate of silver; 100 cub. centim. of this prussic acid furnished 0.332 grm. cyanide of silver, corresponding to 0.067 per

cent. of acid. The same solution required for the complete precipitation of a normal liquid containing in 100 cub. centim. $\frac{1}{2}$ a grm. of metallic silver, 53.5 cub. centim. 100 cub. centim. of the same prussic acid, mixed with potash, and then constantly shaken with the same solution of silver until the appearance of a milkiness, required 27 cub. centim. 150 cub. centim. of the same prussic acid required 40 cub. centim. of the silver solution; according to these experiments the liquid contained—

	By Direct determination.	By a measured quantity of normal liquid in		
		alkaline solution.		acid solution.
		I.	II.	
Prussic acid	0.067 p. c.	0.068	0.067	0.067.

Similar results were obtained by M. Fabre.

It follows from these experiments, that the method of determining the amount of prussic acid in an alkaline liquid by means of a normal solution of silver is as trustworthy and accurate as any of the best methods hitherto employed; whilst in several other respects, for instance the ease and quickness with which the experiment is made, it far surpasses them.

The presence of formic acid or hydrochloric acid in the prussic acid, which would render the determination of its amount by a normal solution of silver inaccurate, has not the slightest influence on its estimation in the alkaline liquid; and it has moreover the advantage, that as soon as the reaction becomes perceptible the operation is terminated, in which it is preferable to similar methods the completion of which depends on the cessation of the reaction. In the estimation in the alkaline liquid, both liquids that are mixed remain clear; as soon as the slightest permanent milkiness is perceptible, the analysis is finished, and to arrive at this point one or two minutes suffice. In ascertaining the quantity directly by nitrate of silver, a precipitate is formed, which renders the liquid turbid; towards the end of the operation it is necessary to wait until this has subsided and the liquid again become clear, in order to determine when no further precipitations occurs. Now with the dilute liquid the last traces of cyanide of silver settle with much greater difficulty than in the estimation of chlorine; and it

is precisely owing to this circumstance that the method is disagreeable and tedious.

Aqueous prussic acid is so rarely employed for medicinal purposes, that a test for that is scarcely required; but the distilled waters of bitter almonds and of cherry-laurel, both of which contain prussic acid, are in daily use; and it is highly desirable that the amount of the active ingredients should, under certain circumstances, be ascertained with accuracy; the process described answers admirably for the purpose.

In general, cherry-laurel water is clear and transparent; the water of bitter almonds on the contrary, is usually milky from the presence of little drops of oil; and it is requisite to mix the latter with 3 to 4 times its bulk of water to render it clear, otherwise the termination of the reaction is not seen distinctly.

The method described may also serve to test the commercial cyanide of potassium; and by its means I have unexpectedly found that the cyanide prepared according to the method described by me contains a comparatively small amount of cyanide of potassium. Two samples from two different preparations were examined; the one furnished 63·5 per cent., the other only 59·99 per cent., of cyanide of potassium.—*Chem. Gaz.* March 1, 1851, from Liebig's *Annalen*, Jan. 1851.

RESEARCHES ON CINCHONINE.

By DR. ILASIWETZ.

The author has obtained two essentially different bodies in the fractional crystallization of commercial cinchonine, the first of which has all the properties generally attributed to cinchonine. It crystallizes in moderately large shining prisms, is tolerably soluble in alcohol, furnishes quinoidine when heated, and sublimes in part to a matted tissue of fine crystals. When sublimed in a current of ammonia or hydrogen, remarkably brilliant prisms, more than an inch long, are obtained. This substance possessed exactly the

composition required by Regnault's formula, $C^{40} H^{24} N^2 O^2$. The sublimed acicular crystals have the same formula.

The second substance, which is obtained by successive crystallization, separates from the alcoholic mother-liquor of the cinchonine in beautiful hard rhomboidal crystals, which may be obtained of very considerable size and diamond lustre from ether, in which they dissolve very readily, which is not the case with cinchonine.

These crystals become opaque when heated, melt, and on cooling solidify to an amorphous mass, and furnish, neither alone nor in a current of ammonia or hydrogen, a trace of crystals.

The analysis of this substance and of its platinum salt led to the formula $C^{20} H^{12} NO^2$, which is the composition of the so-called β -quinine detected by Heijningen in commercial quinoidine. The author calls it *cinchotine*.

Commercial cinchonine moreover contains a tolerable amount of a brown basic resin, which was not further examined by the author, but which appeared to be quinoidine. In a sample of beautifully-crystallized cinchonine from Merk's establishment in Darmstadt, the author found the composition to agree with the formula which Liebig first proposed, $C^{20} H^{11} NO$. From this he concludes that neither Liebig's formula nor that of Regnault should give way for that recently advanced by Laurent, as they actually represent certain kinds of cinchonine. The author has never been able to obtain Laurent's most recent formula with pure cinchonine; according to a series of most careful analyses, he constantly found numbers which led only to the formula $C^{40} H^{21} N^2 O^2$. The platinum salt places this formula beyond doubt, and proves at the same time that it should be halved, and written $C^{20} H^{12} NO$.

In some attempts to oxidize cinchonine by various agents, the author always reobtained pure cinchonine. The cinchonine reobtained was in every case submitted to analysis. In the treatment with chlorine, with manganese and sulphuric acid, with permanganate of potash, with nitric acid, with chloride of phosphorus, further after ebullition with an acid solution of bichloride of platinum, and fermentations with emulsine, the cinchonine comes out unaltered, or a resinous mass is obtained, as in the treatment with chlorine, from the solution of which pure cinchonine was precipitated by ammonia. The results of the analyses of such different samples

all correspond to the formula $C^{20} H^{12} NO$, and are as follows :

	I.	II.	III.	IV.	V.
Carbon. . . .	77·78	77·75	78·24	78·15	78·06
Hydrogen . .	7·72	7·80	7·73	7·75	7·67
	VI.	VII.	VIII.	IX.	X.
Carbon. . . .	78·15	78·15	78·24	78·08	77·57
Hydrogen . .	7·62	7·64	7·73	7·28	7·65

When a solution of cinchonine in alcohol acidulated with muriatic acid is precipitated with bichloride of platinum, a crystalline precipitate of a light yellow, at first almost white color is obtained. This yields on analysis numbers which only accord with Laurent's formula $C^{38} H^{22} N^2 O^2$, so as to lead to the supposition that in the treatment with bichloride of platinum, $C^2 H^2$ had been eliminated in one form or the other. Experiments in this direction however showed nothing of the sort ; on the contrary, it was found that in order to obtain a platinum salt corresponding to the formula $C^{20} H^{12} N O$, the precipitate of the cinchonine with bichloride of platinum must be redissolved in water, which requires very long ebullition. On cooling, a whitish pulverulent precipitate first makes its appearance, and after long standing, a dark yellow, very beautifully crystallized platinum salt separates, which had the following composition :—

Carbon	33·1		20	33·3
Hydrogen	3·6	..	12	3·3
Nitrogen . . . . .	..	..	1	
Oxygen . . . . .	..	..	1	
Platinum	27·38	27·34	1	27·36
Chlorine . . . . .	..	..	2	

The alkaloid separated from this platinum salt by sulphuretted hydrogen gave, after recrystallization, on analysis, numbers agreeing with the preceding :—

Carbon	77·83	20	77·92
Hydrogen	7·65	12	7·79

The cinchonines of commerce are very variable preparations. Besides the one which contained β -quinine, the author analysed a beautifully white crystallized cinchonine, which was mixed with a mere trace of amorphous powder. It furnished :—

	I.	II.
Carbon	67·04	67·11
Hydrogen	7·42	7·58

This consequently contained much less carbon. It was dissolved in dilute muriatic acid, precipitated with ammonia; the precipitate, after being washed, recrystallized from alcohol, and analysed, was found to have the composition $C^{20} H^{12} NO$. Laurent's statements appear to be founded on a cinchonine which possibly contained a small quantity of β -cinchonine, the carbon in which is 4 per cent. less, very little of which therefore would suffice to lower the carbon equivalents in the formula.

Of the formulæ proposed for cinchonine, that of Regnault agrees best with the author's analyses; they however lead more correctly to the formula $C^{40} H^{23} N^2 O^3$, which requires C 78·18, H 7·49, N 9·12, O 5·21. The platinum double salt likewise corresponds with this, $C^{40} H N^2 O^3 + Cl^2 H^2 + Pt^2 Cl^4$.

Carbon	33·1	..	40	33·38
Hydrogen	3·6	..	25	3·48
Nitrogen . . . . .	..	..	2	
Oxygen . . . . .	..	..	2	
Chlorine . . . . .	..	..	6	
Platinum . . . . .	..	..	2	27·42

That in this formula there are 2 equivs. of bichloride of platinum to 1 of cinchonine, may, according to the author, be explained by the fact, that the salt is only formed upon the addition of HCl.—*Chem. Gaz. March 1, 1851, from Proc. Imp. Acad. Vienna, 1850.*

ON THE MANUFACTURE OF ACETATE OF LEAD, AND ACETIC ACID.

By JACOB BELL, Editor of the (London) Pharmaceutical Journal.

Acetate of Lead or Sugar of Lead ; Manufacture of the Brown Acetate or Pyrolignite of Lead.—The distilled pyroligneous acid is saturated with litharge in a tub, and the muddy solution ladled out

into a large pan to settle, which it speedily does; the solution after setting is ladled into a pan (malleable iron,) which may be made of cast iron, 6 ft. long, and 4 ft. broad. The solution is made to boil in this pan, and allowed to settle, it is then transferred into a large hemispherical pan, capable of holding 300 or 400 gallons, when it is brought down to about crystallizing strength. When the solution has become dense enough to crystallize, about three times its bulk of water is run in upon it, whilst boiling, the solution being constantly stirred. By this treatment, a considerable quantity of pyroligneous matters may be skimmed off as fast as they rise to the surface; when they are removed, the evaporation goes on as before. If the solution be still too much colored, another dose of water must be given. A little practice soon enables us to know where the evaporation should be checked. The ordinary method is, to rinse a ladle (which is used to skim off the tar from the solution) through the liquid, and observe how many drops of solution fall from it before the solution takes a stringy appearance; if only ten or twelve fall, then it is strong enough. The liquid is now ladled out into malleable iron pans, 5 ft. long by 3 ft. broad, and about six inches deep, the sides being bevelled, or sloping outwards, from below upwards, to crystallize. After becoming sufficiently firm, the sugar of lead is taken out by inverting the pan on a cloth. The pots used in the above process are heated only at the bottom.—*A. P. Halliday.*

Manufacture of the White Acetate of Lead.—This is prepared by dissolving litharge in acetic acid; the acetic acid is first placed in a vessel, and the litharge added by degrees, well stirring the mixture until the solution does but lightly redden the litmus paper; a quantity of water, equal to about one half the acid employed, is then run into the lead solution; heat is then applied, and the mixture slowly evaporated for about twelve hours, or until it has acquired a density of about 1.500. During evaporation any impurities which rise to the surface are skimmed off, and when the solution has acquired its proper density it is run off into the crystallizing pans. When the mass of crystals has become sufficiently hard to allow of its removal *en masse* from the crystallizers, it is drained and placed on wooden racks in the drying house, and when dry cleaned and broken up into fragments for the market.

The mother-liquor, containing neutral and basic acetates of lead and other metallic salts, may either be treated with vinegar, evaporated, recrystallized, and the residue employed as washings in subsequent operations, or it may be decomposed by carbonate of soda or lime, and used as carbonate of lead, or dissolved in acetic acid, and the supernatant acetate of soda or lime recovered.

The vessels employed in the manufacture of acetate of lead are in most cases made of lead. In Wales the mixing pans are of lead, three-quarters of an inch thick, seven feet long, by four and a half feet wide, and one foot deep. These pans are set on iron plates over arches, and the fire-places are outside the building in order that the acetate may not be darkened by the sulphurous vapors from the coal. The crystallizing pans are of wood lined with thin copper, and are about four feet long by two feet wide, and from six to eight inches deep, sloping inwards at the edges. At Pitchcombe the mixing and crystallizing vessels are both of copper, having a strip of lead soldered down the sides and across the bottom of the vessel to render the copper more electro-negative, there is thus no action on the copper from the acetic acid. Great care is requisite in the drying of the sugar of lead; the temperature of the drying house should not exceed 90° Fah. In Wales the heated air of a stove placed outside the drying house is conveyed through pipes passing round the interior; at other places steam heat is employed for this purpose, which is much to be preferred on account of its being more easily regulated.

We now come to speak of the product of sugar of lead from a given quantity of litharge. 112 lbs. of good Newcastle litharge should produce 187 lbs. of sugar of lead by the employment of 127 lbs. of acetic acid of sp. gr. 1.057, but not more than 180 lbs. is obtained in practice. The quantity of produce given in Ure's *Dictionary of Arts and Manufactures* and in other works, is evidently a misprint, being almost three times the weight of the litharge employed. A manufacturer of sugar of lead would indeed be fortunate who could obtain such a return. In one works in Wales, a ton of Welsh litharge produces, with the acid obtained from one ton of acetate of lime, from twenty-eight to thirty cwt. of sugar of lead; and in another manufactory one ton of best Newcastle litharge, with the acid from one ton and a half of acetate of lime, produces thirty-three cwt. of acetate.

The following process with metallic lead, recommended first by Berard, is easily executed, and it is said by Runge to yield a good product with great economy. Granulated lead, the tailings in the white lead manufacture, &c., are put in several vessels (say eight) one above the other, on steps, so that the liquid may be run from one to the other. The upper one is filled with acetic acid, and after half-an-hour let off into the second, after another half-hour into the third, &c., and so on to the last or eighth vessel. The acid causes the lead to absorb oxygen rapidly from the air, evolving heat, so that when the acid runs off from the lowest it is thrown on the upper vessel for the second time, it forms a certain quantity of acetate of lead in solution, and after passing through the whole series is so strong that it may be evaporated at once to crystallize. There are two points of importance in this manufacture; whatever method may be pursued, they are to employ a strong acid, that less time and acid may be lost in concentrating the liquid, and to keep the solution always acid, to prevent the formation of a basic salt.

It may not be amiss to call attention here to a process patented about ten years since for preparing acetate of lead and other acetates. This process consists in employing the acid in a state of vapor, to act upon the bases, instead of using it in the liquid form. A vessel is provided of adequate capacity for the quantity of acetate required, and constructed of such material as will not be readily destroyed by the acid. The top of this vessel is closed hermetically by a cover, fastened down by any convenient means, and in the lower part of the vessel is placed either a minutely perforated false bottom, or a coiled tube of several convolutions, minutely perforated, to permit vapor to pass through freely. To prevent the loss of acid, there is also placed, at different degrees of elevation, several perforated diaphragms, similar to the false bottom just mentioned, on each of which is spread a layer of litharge, after which the cover of the vessel is to be accurately closed. By means of an ordinary distillatory apparatus, liquid acetic acid (strong or weak, pure or impure) is converted into vapor, which vapor is conducted by means of a pipe into the convoluted perforated pipe before mentioned, or between the real bottom of the vessel and the perforated false bottom; hence the vapor passing through the numerous perforations of the false bottom and diaphragms, diffuses it-

self throughout every part of the vessel, its acid entering into combination with the base employed, and forming the acetate, which falls to the bottom of the vessel, and in its descent meets with the ascending streams of vapor, the acid of which renders it perfectly neutral; meanwhile the more aqueous parts of the vapor become liberated, and maintaining their temperature ascend, and in their passage through the successive layers of the base are thereby deprived of their remaining acid. The vapor thus reduced to simple steam is allowed to escape through one or more pipes at the top of the vessel; and as this steam still maintains a boiling temperature, it is conducted through a worm to evaporate the acetate, or the mother-liquor by its heat. The distillation of the acid is continued until the acetate in the vessel is arrived at the proper degree of concentration for crystallization, which is easily ascertained by examining a small quantity drawn off by a cock at the bottom of the vessel, by which cock the whole contents are discharged when the operation is completed.

As the operation draws to its close, by nearly all the base having combined with the acid, the vapor issues out of the vessel charged with a certain portion of acid; and in order that no loss may be sustained by its escape into the atmosphere, it is conducted into another vessel prepared like the first mentioned, but charged superabundantly with the base, to take up every particle of the acid issuing out of the first vessel, until the operation in that first vessel is ended. As the temperature of the solution of the acetate can never exceed that of the vapor, the crystalline product is of fine quality.

Manufacture of Acetic Acid.—In treating of the manufacture of acetic acid we shall not enter upon any other processes than those of the decomposition of the acetates, as effected either by heat or by sulphuric acid.

Acetic Acid obtained by Decomposition of the Acetates by means of Heat—Aromatic Vinegar.—We have already mentioned, whilst speaking of the production of pyro-acetic spirit, that when the acetates are submitted to dry distillation, acetic acid is produced. The following is another extract from the table then quoted, showing the quantity of acetic acid obtained by the decomposition of the metallic acetates:—

Acetate of silver	107.309
“ copper	84.868
“ nickel	44.731
“ iron	27.236
“ lead	3.045
“ zinc	2.258
“ magnanese	1.285

The crystallized acetate of copper is the salt most usually employed for this purpose—twenty pounds of the powdered acetate are placed in an earthen retort of the capacity of about two gallons, previously luted and exposed to the action of the fire; the elongated neck of the retort is connected with a tubulated receiver, and this with a second and third, the last of which is furnished with a Welter's safety tube, dipping into water. The heat must at first be carefully applied, then gradually increased, and the operation regulated by the developement of the gaseous products, which must not be too slow, or too fast. The receivers must be kept cool. When on increasing the heat it is found that no more vapors are given off, the fire must be put out, and the apparatus left to cool. The acid thus obtained has a greenish color, its specific gravity is 1.061. From 20 pounds of acetate of copper rather more than $9\frac{3}{4}$ pounds of rough acid are obtained. The residum in the retort consists of $6\frac{1}{2}$ pounds of copper in a metallic state, mixed with a small quantity of charcoal. The crude acid thus obtained is next placed in a glass retort of the capacity of about $1\frac{1}{2}$ gallon to which is adapted a tubulated receiver, and the retort is heated by means of a sand-bath. The first portions which come over are very weak, and the product should be kept separate until it comes over of a density of 1.072; the whole of the remaining product is now collected together, and the distillation continued to dryness. The acid obtained shows a specific gravity of 1.088. The weaker products are redistilled, and the stronger portions mixed with the former. The $9\frac{3}{4}$ pounds of crude acid furnish in this way six pounds of pure acid, specific gravity 1.085, three pounds at specific gravity 1.042, and half a pound specific gravity 1.023. The small portion of acetone which comes over with the acid imparts an agreeable aroma to it, and the addition of camphor and essential oils constitutes the aromatic vinegar of commerce.

Manufacture of Acetic Acid by the Decomposition of Acetate of

Soda by Sulphuric Acid.—Any given quantity of crystallized acetate of soda is placed in a copper still, and a hollow place having been made in the mass of the crystals, a quantity of strong sulphuric acid, equivalent to 34 or 35 per cent. of the weight of the acetate of soda employed, is then poured in at once, the crystals forming the sides of the heap in the still are then pushed down into the acid, and the whole stirred with a long broad wooden spatula; the head is then put on and luted, and the connexion made with the refrigerator. Nearly four cwt. of acetic acid, of specific gravity 1.050, may thus be obtained from 3 cwt. of acetate of soda, which only requires to be passed through a calico filter (of the form described in Mohr and Redwood's *Practical Pharmacy*, page 203, fig. 211) [fig. 193, page 191, Amer. edit.] on which some animal charcoal had been placed, to fit it for the market. A small quantity of acetic ether is often added to flavor it.

The still employed should be of stout copper (the solder used in its construction should be silver solder,) having its lower half set in an iron jacket, which either receives the high-pressure steam to be used as the heating medium, or contains oil, tallow, or fusible metal, according as either of these substances may be preferred for use. In the former case a cock is placed at the lower part of the casing to let off the condensed steam from time to time; and in the latter case the iron jacket is placed over the fire, the contents of the still receiving sufficient heat from the heated tallow, oil, or metal with which the copper is still in contact. A safety tube should be attached to permit the rise and escape of the heated oil, &c., should the temperature be raised too high.

The head of the still is of earthenware, and an earthenware, silver, or block tin worm may be employed to condense the acid vapor, according to the supply of water which can be obtained for condensation; or a series of Woulfe's stone-ware receivers, of about twenty gallons each, one-third full of water, may be connected with the earthenware head of the still. In this latter case, at the close of an operation, the acid in the first receiver will be found to be stronger than the second, the second than the third, &c., and if the union of the contents of the whole series will not furnish an acid of the strength required, the stronger portions may be drawn off from the first and second receivers, and the weaker portions in the third and fourth receivers may be placed in the first and second

for the next operation. A silver arm to connect the head with the earthenware worm is sometimes used, a regular supply of cold water being kept dripping on the metallic arm. The residuum left in the still after the distillation of the acid, is sulphate of soda, which should be in the state of an almost dry crystalline powder, when the process has been well conducted: this may be dissolved in water, and the solution filtered, evaporated, and crystallized; or it may be used in the manufacture of acetate of soda.

Manufacture of Glacial Acetic Acid.—Acetic acid may be obtained in a glacial state by using dry acetate of soda from which the water of crystallization has been expelled by heat; to this is added about its own weight of strong oil of vitriol, specific gravity 1.85. The first three-fifths of the product should be collected separately, the last, two-fifths will crystallize.

Manufacture of Acetic Acid by the Decomposition of Acetate of Lime by means of Sulphuric Acid.—Large quantities of this acid are employed in the manufacture of acetate of lead and other commercial acetates, white lead, and emerald green; also in the preparation of the inferior class of pickles, &c. &c. Much of the rough acid is sent from Wales to London, and purified by re-distillation. The rough acid is obtained in Wales and other parts of the country in the following manner:—A cast-iron cylinder, about four feet long and two feet wide, closed at one end, is fitted with an iron rod passing through its interior, and furnished with numerous projecting pieces of iron, which reach almost from the center rod to the inner sides of the cylinder. The other end of the cylinder is screwed on so as to be readily removed at any time when the cylinder is to be cleaned or repaired. This end is divided into two parts, one of which, occupying a space of about two-thirds of the whole, is fixed on the upper part, the other one-third is occupied by a moveable door, closing an aperture through which the contents of the cylinder may be removed; through this upper part one end of the iron rod above-mentioned passes, and is attached to a handle, by means of which a rotatory motion is communicated to the rod and its appendages, and the contents of the cylinder are kept in continual agitation. This vessel is termed an agitator. It is placed in a horizontal position on a mass of brickwork or masonry. At its upper part is an opening, through which the acetate of lime, sulphuric acid and water is passed; motion is given either by

steam or manual power. When the mixture is complete the door is opened, and the contents of the cylinder discharged into a tub or other vessel placed underneath the front of the cylinder. The pulpy mass is next transferred to shallow iron trays two feet wide and from two to four feet in length, and two inches deep. These are placed in cast-iron cylinders about five feet long and three feet wide, and each layer of trays is separated, the one from the other, by means of iron rods placed between them; the cylinders are exposed to the direct action of the fire, and the acetic acid passes off in the form of vapor, which is condensed by passing it through leaden worms immersed in cold water.

This impure acid, which is contaminated with sulphurous acid and free sulphur, produced by the re-action of the tarry matter of the acetate of lime or the excess of sulphuric acid, is then run into leaden vessels, placed in an iron cylinder and submitted to distillation. The liquid product is condensed by passing it through an earthenware worm. The acid in this state is employed in the manufacture of sugar of lead. Fifteen cwt. of brown acetate of lime, with seventy-five per cent. of sulphuric acid of specific gravity 1.770, and ten gallons of water, produce about 1500 pounds of rough acid of specific gravity 1.070. Sometimes a larger quantity of water is employed. On a small scale the following results were obtained:—

Acetate of Lime. lbs.	Sulphuric Acid. lbs.	Water. lbs.	Acetic Acid lbs.	Specific gravity.
12 Grey . . .	9 . . .	15 produced	21½	. 1.056
12 “ . . .	9 . . .	10 “	17	. 1.073
12 Brown . . .	9 . . .	15 “	18	. 1.050

On the large scale, one ton and a half of rough acetic acid, of specific gravity 1.050, should be obtained from one ton of good acetate of lime, and three quarters of a ton of sulphuric acid. Acetate of lime may be so prepared, and the decomposition and rectifying processes so carried on, that the acid obtained is not readily distinguishable from that obtained from acetate of soda.

At some work copper stills, set over the naked fire are employed, and the acid is redistilled in copper stills, set in a sand heat. Iron stills of various sizes, with a flat cover, formed of magnesian lime stone, or of rough burnt clay, or of metallic tin, are also used. Large stills are not desirable, because towards the end of the dis-

tillation, decomposition of the acetic acid is readily effected, in consequence of the destruction which a portion of the mass in contact with the bottom undergoes, whilst all the acid contained in it is being driven off. The distillation should be begun with a gentle fire, and should be carried on without much increasing the heat.—*Lond. Pharm. Jour. December 1, 1850.*

OBSERVATIONS ON ETHERIFICATION.

BY THOMAS GRAHAM, F.R.S., F.C.S., &c.

In the ordinary process of etherizing alcohol, by distilling that liquid with sulphuric acid, two distinct chemical changes are usually recognized; namely, first, the formation of sulphovinic acid, the double sulphate of ether and water; and, secondly, the decomposition of the compound named, and liberation of ether. The last step, or actual separation of the ether, is referred to its evaporation, in the circumstances of the experiment, into an atmosphere of steam and alcohol vapor, assisted by the substitution of water as a base to the sulphuric acid, in the place of ether. The observation, however, of M. Liebig, that ether is not brought off by a current of air passing through the heated mixture of sulphuric acid and alcohol, is subversive of the last explanation, as it demonstrates that the physical agency of evaporation is insufficient to separate ether. Induced to try whether ether could not be formed without distillation, I obtained results which appear to modify considerably the views which can be taken of the nature of the etherizing process.

The spirits of wine or alcohol always employed in the following experiments, was of density 0.841, or contained 83 per cent. of absolute alcohol.

Expt. 1.—One volume of oil of vitriol was added to four volumes of alcohol, in a gradual manner, so as to prevent any considerable rise of temperature. The mixture was sealed up in a glass tube, one inch in diameter, and 6.6 inches in length, of which the liquid occupied 5.2 inches, a space of 1.4 inch being left vacant, to provide for expansion of the liquid by heat. The tube was placed in a stout digester containing water, and safely

exposed to a temperature ranging from 284° to 352° (140° to 178° C.) for one hour.

No charring occurred, but the liquid measured on cooling 5.25 inches in the tube, and divided into two columns, the upper occupying 1.75 inches, and the lower 3.5 inches of the tube. The former was perfectly transparent and colorless, and on opening the tube, was found to be ether, so entirely free from sulphurous acid, that it did not affect the yellow color of a drop of the solution of bichromate of potash. The lower fluid had a slight yellow tint, but was transparent. It contained some ether, but was principally a mixture of alcohol, water, and sulphuric acid. The salt formed by neutralizing this acid fluid with carbonate of soda, did not blacken when heated, from which we may infer that little or no sulphovinic acid was present.

The principal points to be observed in this experiment are its entire success as an etherizing process, without distillation, without sensible formation of sulphovinic acid, and with a large proportion of alcohol in contact with the acid, namely, two equivalents of the former nearly, to one of the latter. When the proportion of the alcohol was diminished, the results were not so favorable.

Expt. 2.—A mixture of one volume of oil of vitriol and two volumes of alcohol, sealed up in a glass tube, was heated in the same manner as the last. The liquid afterwards appeared of an earthy-brown color by reflected light, and was transparent and red by transmitted light. Only a film of ether was sensible after twenty-four hours, floating upon the surface of the dark fluid.

Expt. 3.—With a still smaller proportion of alcohol, namely, one volume of oil of vitriol with one volume of alcohol, which approaches the proportions of the ordinary etherizing process, a black, opaque liquid was formed at the high temperature, thick and gummy, without a perceptible stratum of ether, after standing in a cool state.

Crystals of bisulphate of soda, containing a slight excess of acid, were found to etherize about twice their volume of alcohol in a sealed tube quite as effectually as the first proportion of oil of vitriol, when heated to the same temperature. The two liquids found in the tube were colorless, no sulphurous acid appeared, and only a minute quantity of sulphovinic acid. Crystals of bi-

sulphate of soda, which were formed in an aqueous solution, and without an excess of acid, had still a sensible but much inferior etherizing power.

Expt. 4.—A mixture was made of oil of vitriol with a still larger proportion of alcohol, namely, one volume of the former and eight of the latter, or nearly one equivalent of acid to four equivalents of alcohol. This mixture was sealed up in a tube, and heated for an hour between 284° and 317° (140° and 158° C.) which appeared sufficient for etherizing it. A second exposure for another hour to the same temperature did not sensibly increase the ether product. The column of ether measured 1.25 in the tube, and the acid fluid below 2.5 inches. Both fluids were perfectly colorless.

It thus appears to be unnecessary to exceed the temperature of 317° (158° C.) in this mode of etherizing, and that the proportion of alcohol may be increased to eight times the volume of the oil of vitriol without disadvantage.

Expt. 5.—The proportions of the first experiment were again used, namely, one volume of oil of vitriol with four volumes of alcohol, and the mixture heated as in the last experiment to 317° (158° C.) The upper fluid, or ether, measured 1.1 inch in the tube, the lower fluid 2.65 inches. The latter had a slight yellow tint, like nitrous ether, but only just perceptible. It gave, when neutralized by chalk,—

Sulphate of lime, - - - -	83.11 grains
Sulphovinate of lime - - -	4.91 “

The last salt was soluble in alcohol, and crystallized in thin plates.

Here again the formation of sulphovinic acid in a successful etherizing process is quite insignificant.

New results at 317° , from the other proportions of one volume of oil of vitriol with one and two volumes of alcohol, were quite similar to those obtained in experiments 2 and 8, at the higher temperature of 352° . In none of these experiments did there appear to be any formation of olefiant gas, and the tubes could always be opened, when cool, without danger.

Neither glacial phosphoric acid nor crystallized biphosphate of soda etherized alcohol to the slightest degree, when heated with

that substance, in a sealed tube, to 360° (182° C.). Even chloride of zinc produced no more, at the same temperature, than a trace of ether, perceptible to the sense of smell.

Expt. 6.—To illustrate the ordinary process of ether-making, a mixture was prepared, as usually directed, of

100 parts of oil of vitriol,
48 “ of alcohol (0.841),
18.5 “ of water.

This liquid was sealed up in a glass tube, and heated to 290° (143° C.) for one hour. It became of a dark greenish-brown color, and opalescent, with a gummy looking matter in small quantity. No stratum of ether formed upon the surface of the fluid.

The tube was opened, and the fluid divided into two equal portions. One of the portions was mixed with half its volume of water, and the other with half its volume of alcohol, and both sealed up in glass tubes and exposed again to 290° for one hour.

It would be expected, on the ordinary view of water setting free ether from sulphovinic acid, that much ether would be liberated in the mixture above, to which water was added. The ether which separated, however, amounted only to a thin film, after the liquid had stood for several days. In the other liquid, on the contrary, to which alcohol was added, the formation of the ether was considerable, a column of that liquid appearing, which somewhat exceeded half the original volume of the alcohol added. In fact, the sulphovinic acid was nearly incapable of itself of yielding ether, even when treated with water. But it was capable of etherizing alcohol added to it, in the second mixture, like bisulphate of soda or any other acid salt of sulphuric acid.

The conclusions which I would venture to draw from these experiments are the following:—

The most direct and normal process for preparing ether, appears to be, to expose a mixture of oil of vitriol, with from four to eight times its volume of alcohol of 83 per cent. to a temperature of 320° (160° C.) for a short time. Owing to the volatility of the alcohol, this must be done under pressure, as in the sealed glass tube. The sulphuric acid then appears to exert an action upon

the alcohol, to be compared with that which the same acid exhibits when mixed in a small proportion with the essential oils. Oil of turpentine mixed with one-twentieth of its volume of sulphuric acid, undergoes an entire change, being chiefly converted into a mixture of two other hydrocarbons, terebene and colophene, one of which has a much higher boiling point and greater vapor-density than the oils of turpentine. This hydrocarbon does not combine with the acid, but is merely increased in atomic weight and gaseous density, without any further derangement of composition, by a remarkable polymerizing action (as it may be termed) of the sulphuric acid. So of the hydrocarbon of alcohol; its density is doubled in ether, by the same polymerizing action. Chloride of zinc effects, with alcohol, at an elevated temperature, a polymeric catalysis of the latter, of the same character, but in which hydrocarbons are formed, of even greater density and free from oxygen.

This view of etherification is only to be considered as an expression of the contact-theory of that process which has long been so ably advocated by M. Mitscherlich.

The formation of sulphovinic acid appears not to be a necessary step in the production of ether; for we have found that the etherizing proceeded most advantageously with bisulphate of soda, or with sulphuric acid mixed with a large proportion of alcohol and water, which would greatly impede the production of sulphovinic acid. It appears, indeed, that the combination of alcohol with sulphuric acid, in the form of sulphovinic acid, greatly diminishes the chance of the former being afterwards etherized; for, when the proportion of oil of vitriol was increased in the preceding experiments, which would give much sulphovinic acid, the formation of ether rapidly diminished. The previous conversion of alcohol into sulphovinic acid, appears, therefore, to be actually prejudicial, and to stand in the way of its subsequent transformation into ether.

The operation of etherizing has attained a kind of technical perfection in the beautiful continuous process now followed. The first mixture of alcohol and sulphuric acid is converted into sulphovinic acid, the sulphate of ether and water, which acid salt appears to be the agent which polymerizes all the alcohol afterwards introduced into the fluid. Bisulphate of soda, with a slight

access of acid, acts upon alcohol in the same manner, and its substitution for the acid sulphate of ether would have a certain interest, in a theoretical point of view, although a change of no practical importance in the preparation of ether.

Sulphuric acid does not appear to be adapted for the etherizing of amylic alcohol. M. Balard, by distilling these substances together, obtained a variety of hydrocarbons, some of them of great density, but no ether. The polymerizing action of the sulphuric acid appears to advance beyond the ether stage. I have varied the experiment by heating amylic alcohol in a close tube, 350° (176° C.), with oil of vitriol, to which one, two, three, four, and even six equivalents of water had been added, without obtaining anything but the hydrocarbons of Balard. The formation of these was abundant, even with the most highly hydrated acid, and with a very moderate coloration of the fluid.—*London Pharmaceutical Journal*, Jan. 1851, from *Quarterly Journal of the Chemical Society*.

BABUL BARK.

Recently a sample of Babul or Babool bark (the bark of *Acacia arabica*) has been sent to this country from Calcutta to ascertain if it will be likely to sell for tanning purposes. Some of the leather tanned on the banks of the Ganges with this bark is but little inferior to our oak-bark tanned leather; but there is reason to believe that the freight will be more than the bark will bear. In India, this bark is extensively used in tanning leather. The specimen which we have seen was in coarse, large, very fibrous quills, of a reddish color.—*Lon. Pharm. Journ.*, October 1850.

Varieties.

Presence of Iodine in Sarsaparilla. By M. A. GUILLIERMOND, Apothecary.
—The experiments upon the presence of iodine in sundry plants, as recently published by Prof. Chatin, have induced me to inquire whether sarsaparilla did not owe its anti-syphilitic qualities to the presence of this substance among its constituents. The peculiar odor of the decoction, also, having frequently struck me, I conceived the idea, which has been confirmed by chemical analysis. My mode of procedure was as follows:

Five hundred grammes of Honduras sarsaparilla were incinerated and washed with water, which liquid was then evaporated to dryness, giving an alkaline product which was digested in alcohol. Upon the application of the usual tests for iodine, its presence, in considerable quantity in the state of iodide of potassium was evident. I found no iodine in the root, after it had been exhausted with water, although I found it present in the extract; thus proving that it passes into the aqueous preparations of sarsaparilla in the state of a soluble salt.

It is reasonable to suppose that these results are not unimportant in a therapeutic point of view. They confirm the opinion offered by M. Chatin upon the presence of iodine in plants employed as anti-scorfulous remedies.

This fact being acknowledged it would prove interesting to ascertain the connection existing between the amount of iodine contained in these plants, and the greater or less activity attributed to them. Sarsaparilla may yet become a valuable auxiliary, and in certain cases even a succedaneum of iodide of potassium.—*L'Abeille Medicale*, January 15th, 1851, from *Gazette Médicale de Lyons*.

Conia, Sulphate of Cadmium, &c., in certain Ophthalmic Affections.—We find in the oculistic annals some new formulæ, by Dr. Frommüller. Conia, the active principle of cicuta (*conium maculatum*), has, according to the author, given some surprising results. He employs it in scrofulous ophthalmia, accompanied by “blepharospasmes” and intolerance of light, and recommends the following recipe:

Take of Conia 20 centigrammes,	(2 parts)
Distilled Water 20 grammes,	(200 “)
Alcohol 13 decigrammes,	(13 “)

to be used several times during the day in frictions around the orbits. Mr. Frommuller also mentions having obtained very favorable results from the use of sulphate of cadmium, used according to the following formula as a collyrium in cases of opacity of the cornea:

Take of Sulphate of Cadmium 20 centigrammes, (2 parts)
 Rosewater 45 grammes, (450 ")
 Rousseau's or Sydenham's Laudanum accord-
 ing to circumstances, 2 to 6 grammes, (20 to 60 ")

This author also recommends the use of Tannin in collyrium and ointment, preferring it to the mineral agents usually employed; as better supported, and as producing more energetic contraction of the vascular tissue. The following is the formula he proposes for the ointment:

Take of Tannin 40 to 60 centigrammes, (4 to 6 parts)
 Washed Lard 25 decigrammes, (25 parts)

Mix.

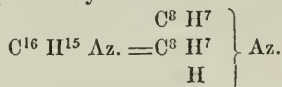
For the Collyrium,

Take of Tannin 30 to 60 centigrammes, (3 to 6 parts)
 Distilled Water 60 grammes, (600 parts)
 Rousseau's* Laudanum 2 to 4 gram-
 mes, (20 to 40 p.)

Mix.

Journ. de Pharm., from Annales Oculistique.

On the Constitution of Conia. By M. R. WAGNER.—From the experiments of Mr. Blyth, it appears that, under the influence of oxidizing agents, conia furnishes butyric acid. This reaction expressed by the formula $C^{16} H^{15} Az. + 4HO + 4O = C^8 H^8 O + Az.$ H^8 has induced Mr. Wagner to propose a hypothesis upon the constitution of conia. Founding his impressions upon the ideas of Mr. Hoffman, relative to the constitution of amidogen bases, (*bases amidées*,) (biethylamine, &c.,) the author thinks conia to be ammonia, in which two equivalents of hydrogen are replaced by two equivalents of butyryle $C^8 H^7$. The constitution of this volatile base is consequently expressed by the formula



Jour. de Pharm. from Jour. far Practk. Chem.

Sophisticated Pepper.—The sanitary commission, charged by the English Journal, the *Lancet*, to examine into the state of the alimentary substances found in commerce, report that the samples of pepper bought of the London spice dealers were contaminated by the admixture of mustard and flaxseed.

* The Abbe Rousseau's Laudanum or drops, is a wine of opium prepared by fermentation, and highly charged with the active principles of the drug, being about four times the strength of the laudanum of the U. S. P., *i. e.* containing one grain of opium to every six drops.

As pepper pays in England a duty of 60 centimes (12 cents,) per pound, and the quantity sold exceeds by a million of pounds that upon which duty has been paid, it follows that the English treasury loses annually, thanks to these pilferers, the trifle of 600,000 francs, (\$120,000.) But this is comparatively nothing to the loss caused by the frauds in coffee, amounting to at least 25,000,000 francs (\$5,000,000,) annually!—*Journ de Pharm, from Gazette Medicale.*

Culture of Tea in Brazil.—Late letters from Rio de Janeiro agree in announcing the growing progress of the tea culture in Brazil. Many of the planters, they say, have given up the culture of coffee, to undertake that of tea, and it is very probable that ere long Brazil will be enabled to produce not only sufficient of the herb for her own consumption, but also for export. Bohea, hyson, and young hyson are the kinds which seem best adapted to the country.—*Jour. de Pharm.*

On a New Source of Carbonate of Magnesite—By M. LANDERER.—In different localities upon the island of Eubon, in the strata of serpentine, there is found an abundance of a hard white rock, which on account of its physical properties has been called by the inhabitants, leukolite, (λευκόλιθος) or white-stone.

The owner of the land supposing this mineral a kind of porcelain clay, exported a considerable quantity of it to England, for the purpose of manufacturing porcelain. In attempting to convert it to this use it was soon perceived that, being in no respect of an argillaceous nature, it was totally unfit for such a purpose, but that it was a magnesite, or more correctly speaking a hydro-magnesite, $MgO \cdot CO_2 + H_2O$, which, as I have just learned, is employed with great advantage for the manufacture of carbonate of magnesite.

The magnesite of Euboa is very white, extremely hard, dissolving in sulphuric and muriatic acids, and evolving carbonic acid gas when exposed to heat. It contains magnesia 48, carbonic acid 36, water 14, and traces of carbonate of lime, oxide of iron and of manganese.

To succeed in the preparation of carbonate of magnesite, it is best to dissolve the magnesite in hydrochloric acid, and precipitate the solution of muriate of magnesite, by the carbonate of potassa or soda.

I do not doubt that this mineral which is plentifully obtained, may be advantageously employed in the manufacture of artificial tiles, resembling fire-brick, for the construction of furnaces.—*Jour. de Pharm., Mars, 1851.*

Massachusetts College of Pharmacy.—The annual meeting of the Massachusetts College of Pharmacy, for the choice of officers, was held at the Tremont House, Boston, on Wednesday, the 19th of March. A number of new members were admitted, and the following gentlemen were chosen the officers for the ensuing year:

Thomas Farrington, *President*; Joseph Burnett, *Vice President*; Henry Ware Lincoln, *Secretary*; Samuel N. Brewer, *Treasurer*; Joseph Kidder, *Auditor*; William A. Brewer, *Corresponding Secretary*; William Brown, Henry D. Fowle, Andrew Geyer, Ashel Boyden, *Trustees*.

The following gentlemen were chosen a committee to consider what measures were necessary to increase the usefulness of the college to its members, and the public, and report at a future meeting:—Dr. George F. Jones, Joseph Burnett, S. M. Colcord, W. B. Little, G. W. Parmenter. Subsequently the President and Secretary were added to the committee.

The meeting was well attended, and remarks were made by several of the of the members; and an interest was exhibited which guarantees continued strength to the institution, and its usefulness to the community.

Voted, That the proceedings be published in the Boston Medical and Surgical Journal. Per order, HENRY WARE LINCOLN, *Secretary*.

Boston Med. and Surg. Journ., March 26.

Northern Dispensary, New York.—From the Annual Report of the Trustees of the Northern Dispensary of the City of New York, to the Legislature of the State, we learn that—

“During the year 1850, their dispensary has furnished medical attendance and medicine to 19,047 individuals as recipients of their institution, of whom 8,090 were attended at their dwellings, and 10,957 were attended at the dispensary. Of these individuals, 5,140 were born in the United States, 12,680 in Ireland, 480 in England, 317 in Scotland, 281 in Germany, 149 in other countries. 615 of the above mentioned individuals were vaccinated.”—*Boston Med. and Surg. Jour., March 26, 1851.*

On the Health of Workmen Employed in the Manufacture of Sulphate of Quinine. By M. A. CHEVALLIER.—The manufacture of sulphate of quinine, which has been carried on for thirty years in France, occasions with some of the workmen particular diseases, which have not hitherto been studied. Having become acquainted with this fact, I made several investigations on the subject; from which it appears that the workmen employed in this manufacture are subject to attacks of a cutaneous disease, which compels them to suspend their work for a fortnight, or sometimes for a month or longer. Some of them are even compelled to seek other employment.

M. Zimmer, manufacturer of sulphate of quinine, at Frankfort, has found that the workmen employed in powdering cinchona bark are attacked with a fever which he has designated the *cinchona fever* (China feber.) This malady is sufficiently severe to induce those attacked by it to renounce the occupation and leave the manufactory. This disease has not been observed in France.

At present no means are known for preventing the cutaneous disease. It affects not only the workmen who are employed in the different operations, but it also attacks persons who are merely exposed to the emanations.

tions from the factory. The sober and the intemperate are alike subject to it.

It has not been established that causes exist which predispose the workmen to this disease, although some persons consider such to be the case.—*Pharmaceutical Journal*, February 1, 1851, from *Repertoire de Pharmacie*.

On Sea-Weeds as the Sources of Acetic Acid. By JOHN STENHOUSE, LL.D., &c.—During the course of some experiments on sea-weeds, Dr. Stenhouse ascertained that a considerable quantity of *acetic acid* was generated during their spontaneous fermentation in warm weather.

Six pounds of fresh, moist *Fucus vesiculosus* were put into an earthen jar with a little quick lime and just sufficient water to cover them, and kept for three weeks at the temperature of 96° F., adding small quantities of quick lime from time to time, to keep the mixture slightly alkaline. When the fermentation was completed, the liquid portion, which contained a good deal of mucilage and some acetate of ammonia, was thrown upon a cloth filter, and the clear liquid which passed through was evaporated to dryness, and then cautiously heated so as not to decompose any of the crude acetate of lime, while almost the whole of the mucilaginous matter was rendered insoluble. The dark brown mass yielded by digestion in water and evaporation, 4 oz. 2 drachms of dry acetate of lime, nearly free from organic matter, from which 696 grains of anhydrous acetic acid diluted with water were obtained, which is equivalent to 1.65 per cent of acetic acid from the moist weed.

Two other experiments somewhat varied gave 1.45 and 1.15 per cent. of acetic acid:—the latter trial was in the open air subject to atmospheric variations, from June to September. Dr. S. thinks the residue will answer nearly as well for manure as the weeds before fermentation.—*Pharm. Jour.*, Feb., 1851, from *Philosophical Magazine*.

Mites in Sugar.—In the *Pharmaceutical Journal*, for February, we find a figure of the *mite* peculiar to brown sugars, and which exists in considerable numbers, in some varieties, both dead and alive. A writer in the *Lancet* for January 18th, 1851, states, that of thirty-six samples of sugar examined, "The disgusting looking acari were present in thirty-five." The cheese, meal and itch mites are also figured, and in the enlarged view present a formidable appearance.

Coffee and its Adulterations.—The *London Lancet*, within a few months past, has been publishing a series of experimental examinations of the more prominent articles of diet as found in the London shops and markets, more especially those sold by the grocers. The first of them is coffee. The structure of the coffee berry is first described very minutely, showing it to consist of angular cells closely adherent together, and enclosing an essential oil on the presence of which the fragrance and some of the active qualities of

the coffee depend. Now as roasting the coffee does not alter the structure of the tissues, an experienced microscopist can, by examining a specimen of ground coffee, decide on the presence or absence of cellular tissue of a foreign character, and by knowing the structural characteristics of the substances used as adulterations, can detect them when present.

Thirty-four specimens of coffee, obtained from different parties in London among the grocers, tea and coffee dealers, were examined with the following results, viz:

"1st. That the thirty-four coffees, with the exception of three were adulterated. 2d. That *chicory* was present in thirty-one instances. 3d. Roasted corn in twelve. 4th. Beans and potato flour, each in one case. 5th. That in sixteen cases the adulteration consisted of chicory only. 6th. That in the remaining fifteen samples, the adulteration consisted of chicory, and either roasted corn, beans, or potatoes. 7th. That in many instances the quantity of coffee was very small; and in others not less than one-fifth, one-fourth, one-third, one-half, and so on, of the whole article."

The *Lancet* gives the microscopic characteristics of the substances used in adulterating coffee, but they are too long for introduction here.—*Extracted from Pharm. Journal, Feb., 1851.*

On Arnica. By Mr. WILLIAM BASTICK.—*Arnica montana*, although not extensively used in this country, is held in high estimation by the medical profession in Germany as an effective remedial agent. It is known to exercise a powerful and defined action on the animal economy. The flowers, and other parts of this plant, have several times been chemically examined, and their virtues have been generally ascribed to an acrid resin which they contain. But there has been much doubt expressed as to whether this resin was really the active principle, for Professor Pfaff, of Kiel, observes, "*Arnica* flowers is one of those agents whose chemical composition, and therapeutic powers which depend on the former, are enveloped in obscurity."

Dr. A. T. Thompson has recorded his belief that he had detected *igasurate* of strychnine in the flowers. This statement induced Versemann, at the suggestion of Pfaff, to institute an inquiry by direct experiment as to its correctness. The result was that he has proved the absence of any compound of strychnine in them. My experiments bear testimony to the truth of his conclusion in this matter, while I differ entirely from him in another one, that in which he denies the existence of any alkaloid in this plant. But it is not altogether surprising that he should have overlooked the presence of an organic base in it, for he proceeded in his research upon the assumption that if *arnica* contained an alkaloid it would be precipitated from its solution by ammonia. This failure of Versmann to eliminate the organic base of *arnica* is an evidence as to the necessity of, as I have previously remarked, Pharmacutists using the improved methods in their investigations.

The flowers of the *Arnica montana* being that part of the plant in which its medical properties are said to be the most predominant, were selected for examination.

They were subjected precisely to a similar process to that by which lobelina was extracted from *lobelia inflata*, the result of which was the elimination of an organic base, arnicina. This substance has a strong alkaline reaction. It combines with acids, forming a series of salts. When exposed to a high temperature it suffers decomposition, and leaves a carbonaceous residuum, consequently it is not volatile. I have not yet been able to ascertain whether it is crystallizable, in consequence of the smallness of the product which the flowers yielded, but, as far as can be judged from its condition when obtained by evaporation from the ethereal solution, it has a disposition to assume that form. To the taste it is slightly bitter, but not acrid, and has the odor of castor. From the aqueous solutions of its salts it is precipitated by tincture of galls in somewhat dense flocks. It is slightly soluble in water, but much more so in alcohol and ether. When subjected to the action of caustic alkalies it is decomposed.

The hydrochlorate of arnicina, after being freed from its coloring matter by animal charcoal, forms stellated acicular transparent crystals.

What are its peculiar therapeutic properties is a question that must remain for the skill of the physiologist to determine. This base, doubtless, deserves a more complete examination than it has received, but this task can only be accomplished by operating on a large quantity of the flowers, as independently of the small per centage of arnicina which the flowers primarily contain, much of it is unavoidably lost in each step of the process for its eduction.—*Pharm. Journ. February, 1851.*

Eau de Cologne. By PROFESSOR VARRENTAPP.—This well-known perfume is a solution of different volatile oils in pure strong spirit. The principal condition for the preparation of a fine water, is the employment of a spirit quite devoid of fusel-oil (oil of grain) and of all foreign odor.

In respect to the proportion and kind of oils employed, we have numerous formulæ. It is of importance that these oils, which are usually purchased of the druggists of the South of France, should be of the finest quality, and and that no oil should be used in sufficient quantity to allow of its peculiar odor being recognisable in the mixture. The oils are to be dissolved in spirit, and the mixture allowed to stand for some weeks (or still better for some months) to improve its odor. Distillation does not effect this; on the contrary, a fresh distilled water requires to be kept a much longer time. Distillation is indeed objectionable, for on account of the greater volatility of the spirit, the oils in part remain behind in the still. Distillation can improve the odor only when the less volatile oil has been used in too large a quantity, and we wish to obtain a better proportion. Before all things, we should employ a pure, old, strong spirit, and not too much of, nor a too strongly smelling, oil.

The different sorts of volatile oil which are obtained from varieties of citrons, oranges, and lemons, in different states of maturity, are the most important, and, therefore, it is most important to ascertain their purity and goodness.

Förster gives the following formula for the preparation of a fine Eau de Cologne: Take of rectified spirit of 82 per cent. of Tralles (=sp. gr. 0.855) 6 [wine] quarts; essence of oranges, essence of bergamot, essence of citron, essence of limette, and essence of petits grains, of each 3j; essence of cedro, essence of cedrat, essence de Portugal, and essence de neroli, of each 3ss; oil of rosemary, 3ij; and oil of thyme, 3j.

Otto gives the following formula for a good Eau de Cologne; Rectified spirit of 86 per cent. of Tralles (=0.846 sp. gr.) 200 [wine] quarts; oil of citrons, lb. iv; oil of bergamot lb. ij; oil of neroli ½ lb.; oil of lavender lb. ss; oil of rosemary, ¼ lb., and spirit of ammonia, 3ss. Mix.—*Pharm. Journal, March, 1851.*

Adulteration of Opium with Salep Powder.—A peculiar adulteration of opium was discovered by Landerer in preparing laudanum from an apparently very good opium, obtained direct from Smyrna. After several hours' digestion the tincture assumed a slimy or mucilaginous condition, and in a few days assumed a gelatiniform condition, and could not be poured out from the glass. By a careful examination, salep powder in large proportion was discovered in the opium; and the author was afterwards informed, that this is a very common adulteration, which is practiced in order to make the opium harder, and accelerate the process of drying it.—*Buchner's Repertorium*, Bd. vi. Heft. 3, p. 349.

[Dr. Pereira (*Elements of Materia Medica*, vol. ii., p. 1742, second edition) mentions a kind of opium which contained a gelatinous substance; and Mr. Morson (*Pharm. Journ.*, vol. iv. p. 503) has described an opium which yielded a bulky gelatinous-looking mass.—*Ed. Pharm. Journ.*]

The Copyright of a Pharmacopœia.—It is reported that "King and Queen's College of Physicians of Ireland" has assigned its interest in the Dublin Pharmacopœia to Dr. Apjohn, who has announced his intention of proceeding by injunction against all those who shall copy the work. This threat is levelled against the authors of Dispensatories, or other works on *Materia Medica*, containing the formulæ of the three colleges, placed in juxtaposition for the convenience of the medical practitioner, the dispenser, and the student. We have heard the names of three authors who are already singled out for attack. We understand that in the case of one of these gentlemen (Dr. Neligan,) Dr. Apjohn served him with a notice a day or two before the appearance of the third edition of his "*Medicines, their Uses and Mode of Application*," warning him not to commit a "breach of the law," in introducing the alterations or additions of the new Dublin Pharmacopœia.

[In the last Edition of the United States Pharmacopœia, the Committee of Revision and Publication retained the Copyright of the work, in view of the possibility of a difficulty of the kind above noticed, so that its pages might be open to all medical writers and commentators.—*Ed. Amer. Jour. of Pharmacy.*

Statement of the Relative Produce of Taraxacum Root at Different Periods of the year.—Mr. Jacob Bell, in giving the following statement, observed, that it was not the result of experiments made for the purpose, but an average deduction from his laboratory-book during several years. The produce in November had sometimes been quite as great as that in October and December, although on the average it appeared to be less. The general result tended to confirm the opinion of Mr. Squire, stated in an early meeting of the Society, that the best time for making the extract is towards the end of the year, it being generally considered that the quality of the extract is the best when the root is in the greatest perfection, of which the amount of produce affords some criterion.

Produce of extract from 1 cwt. of taraxacum root:—

Jan.	Feb.	March	April	Aug.	Oct.	Nov.	Dec.
8½	6½	6	5	6	9	8½	9

The Chairman inquired whether it had been ascertained what the nature of the soil was from which the roots had been taken, in the several cases referred to in Mr. Bell's paper. He (Mr. Squire) had been accustomed to ascertain this point whenever it is practicable, for he thought it very important to collect exact data of this kind with reference to extracts. Much yet remained to be made out with reference to this class of preparations.

Mr. Davenport preferred using the roots which had been grown in a rich and highly cultivated soil.

Mr. Bell said he had not ascertained what kind of soil the roots had been taken from; indeed, he should feel little confidence in the accuracy of the representations made by herb-collectors. He could not account for the fact that the proportion of extract obtained from the root was smaller in November than in October or December, as he considered the root in perfection about November, after which time it was liable to deterioration in case of frost.

Dr. Radcliffe observed, that it had been found in many instances that the juices of plants take a downward direction in frosty weather, which might to some extent influence the quantity of extract obtained from the juice of the root in frosty weather.

The Chairman said, he had noticed that the juice of taraxacum root became more sweet in frosty weather. He considered the root to be in the best state for making extract when there was least of the plant above ground.

Mr. Cracknell thought November was the best month for collecting taraxacum root for making extract. The extract made at this period was less

deliquescent than that made at other seasons.—*Pharmaceutical Journal*, March, 1851.

Poisoning by Twenty-nine Grains of Veratria:—Recovery.—The following authentic case has been communicated to us, with a request that the name of the patient (a retired Chemist and Druggist) may be suppressed:—

A gentleman had a draught and liniment made up at the same time; the draught was to relieve the cholic, and consisted of chloric ether, &c. The liniment was composed of veratria gr. xxx., and rectified spirit ℥ij., and was intended to be rubbed on the forehead to relieve a nervous chronic pain in the head. The dispenser finding his stock of veratria insufficient, put only xxix grains of veratria in, and reduced the amount of spirit in proportion.

On his way home, feeling pain, the patient went into a tavern and got a glass of hot ale and ginger, and then called for a second, into which he put the *liniment*, supposing it to be the draught. Almost immediately afterwards he experienced a peculiar sensation of oppression and anxiety in the head, a sense of suffocation, and he then discovered his mistake. Medical aid was at hand; vomiting was produced by an emetic of sulphates of zinc and copper, tickling the throat, &c. In about half an hour after vomiting, very violent sneezing came on, and continued for about an hour; the patient then slept, and had no disagreeable sensation or symptom since.—*Pharmaceutical Journal*, April, 1851.

MINUTES OF THE PHILADELPHIA COLLEGE OF PHARMACY.

At a Stated Meeting of the Philadelphia College of Pharmacy, held Third month 31st, 1851. Present 18 members.

Daniel B. Smith, President, in the chair.

The minutes of the last Stated Meeting were read and approved.

The minutes of the Board of Trustees were read, detailing their proceedings since last Stated Meeting.

Nineteen young gentlemen, having passed a satisfactory examination, and complied with the rules of the College, were declared graduates of the institution. [The names of the graduates were published in the last number of the Journal.]

Charles S. Rand was elected by the Board a resident member.

The Committee on the Adulteration of Drugs, &c., made the following Report, which was accepted, and the Committee discharged.

The Committee on Adulterated Drugs, &c., report, that they have during the past six months effected some little of the duty assigned them, in so far as they have published ten pages of contributions, towards the object in view, in the Journal, under the head, "On the means for determining the purity of certain Chemicals and Drugs, and for Detecting Adulterations." These contributions are from individual members of the Committee, and it has been thought the most practicable method of accomplishing the work, and attended with less inconvenience to the Committee, and less expense to the College. Should these essays accumulate in number and value, to make it an object, the College may, at some future time, direct them to be systematically arranged and published; meanwhile they will be available to the readers of the Journal.

Having accomplished all that their association as a Committee is likely to effect at present, they ask to be discharged.

DANIEL B. SMITH,

THOS. P. JAMES,

On behalf of the Committee..

The resolution offered at last meeting, by Alfred B. Taylor, relative to the election of Professor Thomas, was again introduced.

On motion, it was Resolved, That the rules be suspended.

The President appointed Wm. J. Jenks, teller, who reported that Prof. Robert P. Thomas had received a unanimous vote, whereupon he was declared a resident member of the College.

The following report was accepted and ordered to be placed on minute:

The Committee on the Sinking Fund report, that, since the Annual Meeting of the College last year, they have received \$195, and paid \$200 for two shares of College loan. The debt of the College being now only \$2,100, the loan-holders are not willing to sell at less than the par value.

WARDER MORRIS,

SAMUEL F. TROTH,

JOSEPH C. TURNPENNY,

Committee on Sinking Fund.

Philadelphia, 3d mo., 1851.

The Annual Report of the Publishing Committee, accompanied by a statement of the receipts and expenditures of the last year, was read and approved, and is as follows:

TO THE PHILADELPHIA COLLEGE OF PHARMACY:

The Publishing Committee respectfully report: that since their last communication to the College they have printed and published five numbers of

the Journal, including the number for April, due to-morrow, and which is ready for delivery.

The general Index to the Journal, alluded to in their last report, was published with the April and July numbers, of last year, and extended to 56 pages of small type, double column. So far as they know it has been received with general satisfaction. Two hundred and fifty copies were reserved for future demand, and placed among the stock of the Journal.

Previously to the commencement of the current volume, it was determined to increase the amount of matter, without adding to the cost of the press-work, and with but a trifling addition to the previous expense of composition; which was effected by enlarging the page slightly, and by throwing all the small articles under the general head of "Varieties," and in smaller type, so as to avoid loss of space by headings. By this arrangement nearly one-fifth more matter is contained in the same number of pages.

It was also determined to append to each number of the Journal a regular advertising sheet, wherein book notices, business notices, advertisements of new preparations, apparatus, etc., might be inserted, at the rate of four dollars per page for each issue. As one of the prominent objects of the Journal is the extension of knowledge, and the consequent discouragement of empiricism, advertisements of *quack medicines*, properly so called, are excluded; and to avoid difficulty in this regard, the Editor announced, in October last, that a line of distinction would be drawn between a reservation of the skill and manipulation necessary in preparing a medicine of known composition, and a reservation of the composition of the medicine; and that the Editor would be governed by this rule in excluding objectionable advertisements. This sheet has steadily increased in dimensions, and bids fair, when it becomes more generally known, to prove a source of considerable revenue.

The Committee have yet to regret the deficiency of correspondents from a distance, as well as of contributors here at home, to the pages of the work. The number of observers throughout this country must be very large; yet the strong tendency of apothecaries to pursue pharmacy solely for a livelihood, without any manifestation of interest for its advancement, in a scientific point of view, is the main cause of the apathy exhibited by those who, if disposed, are able to write effectively.

The annexed summary statement of the Treasurer of the Committee will expose the state of the finances.

CHARLES ELLIS,
W. PROCTER, JR.,
R. BRIDGES,
EDW. PARRISH,
A. B. TAYLOR,

March 31st, 1851.

Committee.

Publishing Committee of Journal of Pharmacy in account with Charles Ellis, Treasurer.

1850.

3d mo. 25, By balance due at last report,	-	-	-	\$ 406 27
“ cash received through the year,	-	-	-	947 99
				<hr/>
				\$1,354 26
To expenses for printing, editing, paper, materials, Com. on Sinking Fund, postage, &c.,				1,025 68
				<hr/>
Leaving balance in hands of Treasurer,	-	-		\$328 58

A communication from the Treasurer, respecting the delinquency of members in liquidating their contributions, was submitted, and a committee appointed to consider the subject of arrearages of members, and report at the next meeting. The President appointed Ambrose Smith, Francis Zerman, and Wm. Procter, jr.

The College proceeded to the annual election of officers, and the following gentlemen, having received a majority of votes, were declared duly elected to the respective offices.

President—Daniel B. Smith.

1st Vice-President—Charles Ellis.

2d Vice-President—Samuel F. Troth.

Secretary—Dillwyn Parrish.

Treasurer—Ambrose Smith.

Corresponding Secretary—Joseph C. Turnpenny.

Publishing Committee,

Charles Ellis,	Dr. Robert Bridges,
Edward Parrish,	Alfred B. Taylor.

Trustees,

Warder Morris,	William Procter, jr.,
Prof. Robert Bridges,	John H. Ecky,
Edward Parrish,	William P. Troth,
Daniel S. Jones,	Edmund A. Crenshaw.

Committee on Sinking Fund,

Warder Morris,	Samuel F. Troth,
Joseph C. Turnpenny.	

Then adjourned.

DILLWYN PARRISH, Secretary

Editorial Department.

ERRATA.—By an accidental omission in copying, overlooked in reading the proof, the sense of the third paragraph from the bottom at page 120, in the number for April, in the Essay on Fluid Extract of *Serpentaria*, was entirely changed. It should read thus:—"By the exercise of a reasonable amount of care in evaporating, the dissipation of the volatile principle can in great measure be avoided; for a specimen of the extract prepared as above was found to possess *not only the bitterness and acridity of the root itself, but also to a very considerable extent its peculiar aroma. The residue left in the displacement apparatus was found to possess little or no power of imparting,*" &c. &c. The words in italics were omitted. At page 119 the author's name should read "John C. Savery," instead of "John B. Savery," as printed. Subscribers will please to make these corrections.

FATAL RESULT OF CARELESSNESS.—Again it has become our duty, however disagreeable, to notice the fatal consequences of a disregard of those nice rules of practice which should govern the physician in prescribing, and the apothecary in fulfilling his written requests. From the *Public Ledger* of June 2d, we learn that Dr. B. McNeal prescribed a mixture of six drachms of castor oil and two drachms of oil wormseed, for a child between four and five years old, to be given in tea-spoonful doses. The prescription was taken to the apothecary store of Mr. Robert Shoemaker, and given in hand to his assistant, David A. Shultz, who, owing to the imperfect manner in which the prescription was written, read it oil of rosemary and oil of wormseed, and so dispensed it. The mixture was given at repeated doses from Wednesday to Friday, at which time, the increased indisposition of the child induced the parents to send for the physician, who, perceiving that something was wrong, on enquiry of the apothecary, learned that his prescription had been misinterpreted. The child died on the ensuing morning from the effects, directly and indirectly, of the stimulating mixture. The following is the verdict of the Coroner's Jury summoned for the occasion:

"That the said Henry J. Rowland came to his death by a seated disease of congestion of the brain, which disease was matured from the disorganization of the stomach, produced by over-doses of wormseed oil, as prescribed by the family physician. The Jury deem it but justice to state, that no blame should be attached to David A. Shultz, in the employment of Robert Shoemaker, Druggist, in causing the death of said child."

From the same source, we are informed that Dr. McNeal wrote for castor oil under the name of "Ol. Resini" but according to Mr. Shoemaker, (*North American*, June 3d,) the "i's" were not dotted, and the "e" looked as much like an "o" as anything else, so as to give the appearance of "Rosmi."

In commenting on this unfortunate occurrence, it is only with a view to guard *future* practice, by a recurrence to *past* experience. The physician was censurable, 1st, for prescribing a substance not used in medicine, viz. (Rosin oil,) and which he did not intend; 2d, he was blamable for writing his prescription so miserably bad, that the apothecary read it a third substance, also not intended. 3d, he may have been wrong in directing twenty-four drops of the oil of wormseed for a dose, to be repeated, but as he intended it to be given with castor oil, the modifying influence of the latter, by diluting it and urging it along the alimentary canal, might have rendered it innocuous, or at least not fatal.

On the other hand, the apothecary was culpable, 1st, in dispensing the prescription, even if it had been plainly written, as understood by him, because he should have known that the oils of rosemary and wormseed have few therapeutic properties in common; that the first is rarely if ever used internally, and the latter, never externally; 2d, admitting they might have been intended together, the dose indicated in the prescription should have deterred him from dispensing it until the physician had been consulted. We cannot better convey our sentiments on this point, frequently before expressed, than by quoting the following paragraph from a lecture published several years ago:

"It should be a constant rule in compounding every prescription, to recur to the questions, *is this as the doctor designed? are the doses within propriety?* or if extraordinary, *does the case demand it?* If the directions for use are appended, a judgment can at once be arrived at; if not, a little tact will gain the necessary data by enquiries of the messenger skillfully propounded; and it is better even to delay the dispensation of the prescription until the physician has been consulted, rather than peril the life of the patient, or the reputation of his medical servitors." (See vol. xix. page 251 of this Journal.)

In this instance, had these rules been observed, the physician would have been spared the mortification arising from exposed ignorance, and the painful reflection that his carelessness has been the primary cause of the death of a fellow-creature; while the apothecary, instead of being accessory in act to the mournful result, would have had the gratifying consciousness of having shielded the physician from censure and the patient from harm.

Much has been written and published in the newspapers about the *necessity* of physicians writing their prescriptions in English, as a remedial policy for these distressing occurrences. Were these *reformers* better informed on the subject, they would withdraw their suggestion as being pregnant with evils far greater than those they propose to remove. For instance, take the root of *Hydrastis Canadensis*, one physician would direct, "Take of Golden Seal

root," another, "Take of Yellow Root," a third, "Take of Orange root," and a fourth, "Take of Puccoon root," and they would all mean the same thing. Would not the license thus given tend to multiply the difficulty already existing? We think so. We have been a little amused by observing within a few days, an attempt to anglicize a prescription by a physician, who directed, among other things, "Powder of Conium" and "Extract of Hyoscyamus," which are hybrids between pharmaceutical English and botanical Latinized Greek. He should have written, "powder of Hemlock leaves," and "powder of Henbane leaves." Should the advocates for *prescription English* carry the day, and induce our "most potent, grave and reverend seignors" at Harrisburg, to send forth the fiat compelling physicians to murder the king's English, we shall have some rich specimens of nomenclature; and in view of such a state of things, we would advise our good friends Blanchard & Lea, to get out with all expedition, a good dictionary of synonyms.

But in earnest;—let every physician as a matter of duty, possess a copy of the Pharmacopœia, and prescribe according to its simple and beautiful nomenclature, not running after that of the London, or Edinburgh, or Dublin, or any other Pharmacopœia. Let them exercise the same care in writing a prescription involving the life of a fellow creature, that they would in penning and wording a *check* or *note of hand*, involving their own pecuniary interest, and our word for it, accidents of the kind in question would be "few and far between," and apothecaries would be relieved from a load of responsibility not now appreciated by the public.

INSPECTION OF DRUGS.—The want of a tariff of standards for the guidance of the Drug Examiners under the Act in reference to adulterated Drugs and Chemicals, has been felt almost from the first application of the law. In many cases no difficulty need arise if the officers have the qualifications necessary for the office, but in others, a difference of opinion may exist which may be sufficient to render the action of the law unequal in its influence on the importer, as it is carried out at one port and another. In framing the Act, it was hardly to be expected that such standards could be given, and it was wiser to try its working, (as has been done,) until experience should point out the deficiencies, and then attempt a remedy.

Some members of the New York College of Pharmacy, became so impressed with the importance of the subject, as to bring it before their Board of Trustees, who appointed a committee to investigate the subject. The result was, that in a matter so generally concerning the profession, they considered that the other Colleges of Pharmacy should take part, and accordingly an invitation was extended to the Colleges at Boston, Philadelphia, Baltimore and Cincinnati, to send delegates to a *Convention* to be held in New York, on the 24th of April, for the purpose of recom-

mending a tariff of standards for the use of Drug Inspectors—which it was proposed to bring before the National Medical Association, to meet on the 6th of May, at Charleston, S. C., that its influence might be brought to bear with Congress.

Owing to the short notice given, the delegates from other Colleges did not arrive to take part in the proceedings, but several of them forwarded communications expressive of their approval of the object in view. The Philadelphia College of Pharmacy appointed a committee who were empowered as delegates, should they be able to get to New York, or if not, to forward such a paper as should express the sense of the College. It was the general opinion of the members present, that the subject merited the serious attention of the College, but that the time (four days) was too short to accomplish anything.

The delegates from the New York College, adopted the following report of their Board of Trustees, and forwarded it by Dr. C. B. Guthrie,* to the meeting of the National Medical Association, at Charleston, S. C., viz:

To the Board of Trustees of the College of Pharmacy of the City of New York,

The Delegates appointed to attend the proposed convention of the several Colleges of Pharmacy, to consider of, and recommend standards for certain Imported Drugs, report: That they have given attention to their duties and have endeavored to arrange the order of their proceedings for bringing the subject under their care before the Convention.

They have, in a general way, and for the purpose of this enquiry, classified the great variety of Imported Drugs and Medicinal Preparations, in the hope of deciding, as nearly as practicable, upon the qualities of genuineness, purity and strength, which they ought to possess to answer the intention of the Law of Congress, and secure to the community reliable medicines in those substances and manufactures which our necessities com-

*Since writing the above, we were a little surprised, in conversation with a member of the Medical Association, which recently met at Charleston, to learn, that Dr. Guthrie went to that body as a *delegate* from the New York College of Pharmacy, knowing as we did, that that body was strictly medical in its constitution. It is to be regretted that our sister Institution should have committed this oversight, as it was the occasion of considerable discussion, resulting in the passage of a resolution expressly declaring the ineligibility of delegates from Colleges of *Pharmacy* and *Dentistry*, for members of the Association.

We are also informed that the communication of the College, instead of coming forward as a distinct proposition from that body to the Association, as it should have done, was incorporated with the Report of the Committee on Adulterated Drugs, &c., which Report was so badly prepared, as to be refused publication in the minutes of the Association, and was laid on the table, carrying with it in its rejection, the important proposition from New York.

pel, or our interest leads us to procure from abroad. The delegates have concluded to propose to the Convention, with the approbation of the Board, that in their judgment,

Leaves, Flowers, Seeds, Berries, Fruits, Herbs, Roots, Woods and Barks should be true, fresh and sound.

Gums, Resins, and Gum Resins, should be free from evident intentional adulteration.

Balsams should be pure.

Chemicals should be pure as practicable, and free from evident adulteration. Iodine should not contain more than three per cent. of impurities.

Medicinal Oils, Fixed and Essential, should be pure.

Aloes should be free from impurities and sophistication.

Elaeterium should be pure.

Opium should contain eight per cent. of pure Morphia, and be free from evident sophistications and impurities.

Scammony should contain not less than seventy per cent. of the resin of Scammony.

Pharmaceutical preparations should correspond with the requisitions of the Pharmacopœias by which they profess to be made, and the Pharmacopœia should be stated on the label of each bottle or package.

Extracts and Inspissated juices should be fresh and pure.

The following articles we think should be excluded:

All factitious articles.

Carthagena and Maracaybo Barks, and every article evidently intended for purposes of adulteration or sophistication.

English or Rhapontic Rhubarb.

All damaged Drugs.

Every package should be examined.

It is proposed to present for the consideration of the National Convention, and for the action of Congress, that Drugs and Chemicals which may not come up to the Pharmacopœia Standards, but which may yet be properly and profitably used for manufacturing into regular products of the Pharmacopœia, may be admitted under bond to be so appropriated and manufactured only.

(Signed)

GEO. D. COGGESHALL,
JOHN H. CURRIE,
C. B. GUTHRIE.

New York, 22d April, 1851.

By a letter from Dr. Guthrie to one of the committee, we are informed that the proposition was laid on the table, not being considered sufficiently definitive in its details, that the sentiment of the Association was evidently in favor of such a tariff of standards, but they wanted it

to be more fully matured by a Convention of the Colleges of Pharmacy.

In looking over the above report we must confess that we do not think it sufficiently finished for the action of the Medical Association. For instance, it says, "Leaves, flowers, seeds, berries, fruits, herbs, roots, woods and barks, should be *true, fresh and sound.*" Now let us apply the recommendations. The *first* we will admit, that drugs should be *true*. The *second* would create not a little difficulty among the inspectors. Fresh Jalap, or Calisaya Bark, or Ipecac, or Nux Vomica, or Quassia, may, or may not be as good as the same drugs that have been years in store, if well kept. In regard to the *third*, a difficulty would arise unless the degree of soundness shall be expressed, for it will be very difficult to find a case of rhubarb, a bale of senna, or a cask of nutmegs, that is absolutely sound; and a rigid inspector might have difficulty in passing such articles, a portion of which are not sufficiently pure, whilst the largest part are. In such a case, should he be required to reject the unsound pieces, amounting to one tenth, or because nine-tenths are good, pass the whole? An other example:—Digitalis leaves of the first year's growth, may be *true, fresh and sound*, and yet be very inferior in medicinal power. Belladonna, Henbane or Hemlock leaves, may have these characters, and yet from having been collected too early, be greatly deficient in their active principles. Should not the criterion in these cases be of a chemical nature. For instance, long experience has given the manufacturing chemist such expertness, that with a few precipitate-yielding tests, he can soon arrive at the real value of a lot of bark or opium. Why cannot similar tests be applied to the narcotic leaves, for instance? The precipitate yielded by tannic acids, cautiously added to their concentrated solutions, would probably be found to correspond with the proportion of their active principles.

Again. The Report says, "Elaterium should be pure." How is a drug inspector to know that given specimens are pure? We answer that his judgment should, where the least doubt exists, be founded on the proportion of elatin it will yield. The business of any authority, therefore, who aims at making a standard for Elaterium, should be to ascertain what is the *least* per centage of elatin that this drug should contain to be a reliable therapeutic agent? and so of other drugs capable of the application of the same principle. The question for such authority to decide, is not that drugs *should be true, fresh and sound*; all admit that; but what they *must be* to pass the inspection, and to make the law practicable. Positive standards should be given, wherever it is possible, as recommended for opium and scammony in the report, and for the narcotic leaves and elaterium in these remarks. The Inspector need not apply the test in all cases, but in those where the least doubt exists.

Our correspondent, (Mr. Coggeshall,) suggests the propriety of all the

Colleges of Pharmacy deliberately considering the subject, and appointing delegates to a Convention to be held in New York, some time next autumn, so as to prepare to bring the matter before Congress in a well digested form. We approve of this course, and believe that if each College would appoint an efficient committee, and proceed on a generally understood plan, so as to get at the root of the difficulties now experienced, the delegates would have something *real* to act on, and from the joint labors of all the Colleges, would be able to construct a tariff of standards, worthy of American Pharmacy, and fraught with the greatest usefulness to the medical interests of the country.

The Pharmacopœia of the United States of America. By authority of the National Medical Convention, held at Washington, A. D. 1850. Philadelphia: Lippincott, Grambo & Co. 1851. pp. 317, 8vo.

The publication of the Pharmacopœia was announced in the April number of this Journal: we propose now, to give a condensed notice of those portions of the work, which bear the impress of the revisors; and when sufficient time shall have elapsed, to enable pharmacutists to give the new or modified formulæ an impartial trial, we hope to receive their critical remarks, favorable or otherwise, for our pages.

THE LIST.—A comparison of the Official lists of 1840 and 1850, will exhibit, comparatively, few points of difference. *Acetic acid* has been placed there from among the preparations, its sp. grav. reduced to 1.041, and its strength directed to be determined by 100 grains of it, requiring 60 grains of bicarbonate of potassa for saturation. It is therefore eight times the strength of standard distilled vinegar, and is intended to be represented by the Commercial No. 8 acetic acid. *Nitric acid* is required to be of the density 1.42, which indicates an acid of the composition NO^5 , 4HIO, the most permanent of the nitrates of water. We deem this a great improvement, and one that will enable the apothecary to comply with the letter of the Pharmacopœia, when the strength of this acid is in question, because by boiling a weaker acid it concentrates till it arrives at that strength, by losing more water than acid, and by boiling a stronger acid it is reduced in strength, until it acquires that density, losing more acid than water. *Aconite root, Metallic Arsenic, Cotton, Oil of bitter almonds, and Nitrate of Lead*, have been introduced in reference to certain preparations, while *Althea and Arnica flowers, Quince seeds, Extract of (Indian) Hemp, Frostwort, Burdock, Mace, Cod-liver oil, Eggs, Chlorate of Potassa, Brandy and Port Wine*, are brought forward as an extension of the list, for extemporaneous prescriptions. It should also be noted that the word "*Diospyros*," now means the *unripe fruit of the persimmon*, and not the bark, as in 1840. *Changes in the Official names of drugs*, should be made with jealous caution, and nothing but an alteration in the *import* of terms by the progress of science should justify them. The

few innovations of this kind in the new Pharmacopœia, are backed by good reasons, and some names which might have been changed were left as before, rather than risk the disturbance caused in the names of preparations. The *test directions* appended to chemical drugs, have been extended and improved. Apothecaries would do well to *apply* them occasionally, to the articles they purchase. The note to *Chlorinated lime*, points out an easy method of determining its strength, which is required to be 25 per cent. of chlorine as a minimum.

PREPARATIONS.—*Aceta*.—Diluted acetic acid is directed in lieu of distilled vinegar, in the *medicated vinegars*, with the option of using the latter when more convenient, and the alcohol previously added, is now omitted as of no use.

ACIDA.—*Galic acid* is new—The process by atmospheric action, on moistened powdered nut galls, is adopted. The rejection of the first liquid by expression is an improvement, enabling the operator to avoid the coloring and gummy matters (to a great extent) which tend to embarrass the crystallization of the acid. One very important oversight has been made in this formula, which we desire to direct attention to; it is in using the ordinary instead of the purified animal charcoal. The former nearly always contains so much iron as to form an inky compound with the gallic acid. *Acidum Hydrocyanicum Dilutum*, is now the official name for Prussic acid. *Diluted Nitric Acid* is now made with one part by measure of Nitric Acid, 1.42 to six parts of water. Formerly it was one to nine, and as little regard has been heretofore had to the strength of the acid used, there is every probability, that this preparation will be stronger in *practice* than it has previously been, although the same in theory. *Elixir of vitriol* is now made without the useless delay required by the old formula.

ETHEREA.—*Æther* and *Spiritus Ætheris Compositus*, are the new names for sulphuric ether, and Hoffman's anodyne. *Chloroform* is classed as an ether, and a practical process, based on Soubeiran's, is given for its preparation. *Collodion* is also found with the ethers. We have tried this formula several times, and have never failed in obtaining a soluble gun cotton, and an adhesive solution. In general *three* minutes will be found sufficient for the due impregnation of the cotton, if it is properly brought in contact with the acid mixture.

AQUÆ MEDICATÆ.—*Aqua Amygdalæ Amara*, or bitter almond water, is made by dissolving 16 minims, (about 32 drops) of oil of bitter almonds in two pints of water, by the aid of a drachm of carbonate of magnesia. *Apothecaries and druggists should carefully distinguish this preparation from the Bitter Almond Water of the foreign Pharmacopœias*, which is a saturated solution of the oil containing a larger per centage of *prussic acid*. The proportion of carbonate of magnesia in the formulæ for the medicated waters, is very properly increased, promoting more effectually the solution of the oils and camphor in water.

ARGENTUM.—The process formaking *Cyanuret of Silver* has been simplified by preparing the hydrocyanic acid, and the cyanuret, both at one operation. *Argenti Nitræs* means crystallized nitrate of silver. *Argenti Nitræs Fusus*, the nitrate in cylindrical sticks. The test note to the latter, will enable any apothecary to prove its purity with ease. *Oxide of Silver* is new, and is prepared from the nitrate of silver and solution of potassa. (U. S. P. strength.) An ounce and a half of *white caustic potassa*, dissolved in a pint and a half of water, will afford a substitute for the officinal solution, when it is not at hand.

ARSENICUM.—*Iodide of Arsenic* is new—and a simple and practicable process given for making it. Particular attention should be given to have the metallic arsenic in a *very fine* powder, and equally disseminated through the powdered iodine before applying heat, and the smaller the flask, capable of holding the mixture in its bulb—the better. (*Donovan's*) *Solution of Iodide of Arsenic and Mercury*, is made with ease and dispatch.

CALX.—*Precipitated Carbonate of Lime* has been introduced with the precaution, suggested by Dr. Bridges, to get a fine powder.

CERATA.—*Ceratum Calaminæ* is the new name for cerate of impure carbonate of zinc, and the former name of the latter—*Ceratum Zinci Carbonatis*—is now appropriated to a cerate made, with the precipitated carbonate of zinc. *The Cerate of Spanish Flies* is made rather softer than formerly, by decreasing the proportion of Wax and Resin, and increasing proportionably the Lard.

DECOCTA.—The former ambiguity in reference to *Decoctum Cinchonæ* is now avoided by having separate decoctions of *Yellow* and of *Red Bark*. The boiling process in making *Compound Decoction* of Sarsaparilla, is preceded by 12 hours cold maceration—a decided improvement.

EMPLASTRA.—*Emplastrum Ammoniaci cum Hydrargyro* has been introduced from the London Pharm. In the formula for *Assafetida plaster*, alcohol has been substituted for diluted alcohol, as a solvent for the gum resins, by which the volatile oils and resins, the only parts desirable, are dissolved, and the gummy matters left. *Burgundy Pitch Plaster* is a substitute for the commercial drug which is too friable in cold weather. The proportion of soap has been reduced, and the manipulations improved, in the formula for *Soap Plaster*.

EXTRACTA.—*Extractum Cinchonæ Flavæ*, and *Extractum Cinchonæ Rubræ*, now replace the *Extractum Cinchonæ* of 1840, which was made of any *Peruvian* bark the apothecary might choose, and it is hardly necessary to say, *cheap Pule Bark* was often chosen. *Acetic extract of colchicum* is new—and is an efficient preparation, when made from good root. In making it, glass or porcelain percolators and evaporators should be used, on account of the acid. The formula for *Extractum Conii*, is the most improved pharmacopœial one extant, as also is that of *Extractum Taraxaci*. *Aqueous Extract of Opium*, and hydro-alcoholic *Extract of Rhubarb* will also be noticed among this class of medicines.

EXTRACTA FLUIDA.—This new class of preparations, embraces three distinct kinds, viz: oleo-resins, concentrated syrups, and concentrated tinctures. Two of the first, four of the second, and one of the last are adopted. The *Extractum Piperis Fluidum*, is the officinal substitute for oil of black pepper, from which it differs in containing more volatile oil.

FERRUM.—*Tincture of Chloride of Iron*, is made expeditiously by the aid of heat, and *Citrate of Iron* is introduced. Many prefer the *Ammonio-Citrate*, as being more soluble. For pills or powders, the officinal citrate is to be preferred, and when the form of solution, or syrup is often desirable, it will be found convenient to keep a concentrated solution ($\frac{1}{2}$ oz. per fluid ounce) at hand. *Solution of Iodide of Iron* differs from that of 1840, in the substitution of 12 ounces of sugar, for 5 fluid ounces of Prepared Honey. It is more easily prepared. The *Solution of Nitrate of Iron* is made by the formula of the new Dublin Pharmacopœia, which is nearly that of Mr. Kerr. It is an unsatisfactory preparation, and is not permanent as usually made. The suggestion to add sugar does not prevent its changing after a length of time. Mr. Samuel Simes, Pharmaceutist, of this city, makes a syrup of proto-nitrate of iron, of a light greenish color, and thick consistence, which Dr. Hays and others use with decided advantage in cases where the sesquinitrate is indicated. In the *test directions* to the formula, for *Phosphate of Iron*, the word "insoluble" in the last line, should read "soluble." Iron by hydrogen, under the name of *Ferri Pulvis* has been introduced, and a correct process given for its preparation.

GLYCERINA.—*Glycerin* is directed to be made from the washings of lead plaster. Apothecaries should attend to the appended test directions, and see that its sp. grav. is correct, and that it is free from lead.

INFUSA.—*Infusum Diosmæ*—now reads, *Infusum Buchu*. *Infusum Cinchonæ*, has been replaced by separate infusions of *Red* and of *Yellow Bark*; and in compound infusion of bark, the *Red* bark is specified as the kind to be used. *Infusion of Cayenne Pepper* is new. *Infusion of Dandelion* is substituted for the *decoction* very properly. *Infusion of Ginger* is new.

MAGNESIA.—*Solution of Citrate of Magnesia* is among the preparations. It is one of the most popular and valuable of the new articles.

MELLITA.—The process for preparing *Honey of Roses* has been greatly improved, both as to its color, flavor and consistence.

MISTURA.—*Mistura Glycyrrhizæ Composita* is the officinal name for *Brown Mixture*, so long and favorably known in this city as an expectorant.

OLEA DESTILLATA.—The *Oils of Cloves and Cubebs*, now among the preparations, were formerly in the list. The *Oils of Valerian, Copaiba and Tobacco* are new; the latter is an empyreumatic oil, obtained by distilling dry tobacco in a green glass retort, heated to redness by means of a sand bath.

PILULÆ.—The consistence of the *Pills of Carbonate of Iron* has been improved by substituting a portion of sugar for honey, and the manipulation altered so as to be more correct and explicit. *Pills of Iodide of Iron* are new. They should only be made extemporaneously. The consistence of *Pills of Sulphate of Quinia* is improved by the use of honey.

PLUMBUM.—*Iodide of Lead* is introduced, and the nitrate is employed as its source, which is greatly preferable to the acetate, because the acetate of potassa resulting, when the latter is used, acts as a solvent for the iodide and causes waste.

POTASSA.—*Pure Carbonate of Potassa* is made by heating the bicarbonate to redness, lixiviating and evaporating to dryness. *Citrate of Potassa* at last is a recognized preparation, and is made from the bicarbonate of potassa and citric acid. By employing the latter salt, the silica of the carbonate is avoided. In the note to the formula for *Liquor Potassæ Citratis*, or neutral mixture, it is stated that that preparation may be made from citrate of potassa and water, but it thus contains no carbonic acid, which is considered a desirable ingredient. This may be remedied by dissolving the citrate in carbonic acid water. *Cyanuret of Potassium* is now made by Liebig's formula, which yields it sufficiently pure for medical use and is a more manageable process. *Iodide of Potassium* is directed to be made by saturating a solution of potassa with iodine, evaporating to dryness, and heating the residue to redness, mixed with charcoal powder. The residue is lixiviated, and yields by evaporation a pure-white salt.

SPIRITUS.—In *Compound Spirit of Juniper*, *Spirit of Pimento*, and *Spirit of Rosemary*, the volatile oils are merely dissolved in the alcohol without distillation.

SYRUPUS.—*Syrup of Gum Arabic*, we are glad to see, has found a place, after being omitted in the edition of 1840. The gum is directed unpowdered, to enable the apothecary to select it. *Syrup of Citric Acid* is a substitute for syrup of lemons, than which it is much less acid. *Syrup of Garlic* is now made without heat, and a specified quantity of the acetic liquor is directed. There are two formulæ for *Syrup of Rhatany*:—In one the solution of extractive matter is obtained by direct solution from the root; in the other, the extract is dissolved in water and filtered. As only the best root will yield two ounces of extract to the pound, it follows that the syrup made directly from the root is liable to vary in strength. It is better therefore to employ the extract when it is of aqueous origin. The formulæ for *Syrups of Rhubarb*, *Ipecac.*, *Seneka*, *Tolu* and *Ginger*, have been modified advantageously. *Wild Cherry Syrup* is new in the work. The first 500 copies of the Pharmacopœia that were issued contained an error in the second formula for Compound Syrup of Sarsaparilla, the words *two pints* being used instead of *ten pints*. In the remainder of the issue the leaf was reprinted correct. Those whose copies contain the error should correct it with the pen.

TINCTURA.—*Tincture of Aconite Root* has been made weaker than Fleming's, being twelve ounces to two pints. It requires careful manipulation to exhaust the root with the small proportion of menstruum, and we have found digestion at 150° in a corked bottle to aid very much. *Tincture of Peruvian Bark* is made from *Yellow Bark*. The *Compound Tincture from Red bark*. *Tincture of Jalap* is weaker in theory, but of the same strength in reality. If *Tincture of Nux Vomica* is made by displacement, the nux vomica should be in fine powder. The formula for *Tinctura Saponis Cmpborata* has been improved by the addition of water.

TROCHISCI.—Lozenges of *Bicarbonate of Soda* have been introduced.

UNGUENTA.—The manipulation in the process for *Citrine ointment* has been modified for the better. *Stramonium ointment* is now made from the *extract*. In making *Iodine ointment*, a little iodide of potassium is directed, which enables the apothecary to dispense it of a perfectly uniform consistence, without the presence of particles of undissolved iodine.

ZINCUM.—The direction for purifying acetate of zinc has been improved by substituting the moist carbonate of zinc for chlorinated lime. And a formula has been given for *Precipitated Carbonate of Zinc*, which preparation is used in making the oxide of zinc, and as a substitute for calamine.

Whatever may be the opinions of pharmacutists regarding particular items, we believe all will agree that as a whole the work embodies a fair representation of the more important improvements in Pharmacy as it now exists. We cannot leave the subject without recording our opinion in favor of a *cheap duodecimo* edition of the Pharmacopœia, so that *every* apothecary, physician and medical student, can have a copy, and become familiar with the work. A large majority of physicians and apothecaries in this country know nothing of our Pharmacopœia except as they learn it through the dispensatories, where it is so mixed up with the British Pharmacopœias as to frequently confuse both physician and apothecary; and whilst we unhesitatingly express the opinion that the United States Dispensatory is the most practically useful work of the kind in the English language, we would be glad to see our National Pharmacopœia published with a special commentary, explanatory of hundreds of points of interest, which, owing to the dogmatical form of such works, are left unexplained.

The Physician's Prescription Book: containing a list of terms, phrases, contractions, and abbreviations used in prescriptions, with explanatory notes; also the grammatical construction of prescriptions, etc. etc. To which is added a key containing the prescriptions in an unabbreviated form, with a literal translation intended for the use of medical and pharmaceutical students. First American, from the tenth London Edition. Philadelphia, Lindsay & Blakiston. 1851. pp. 288. Duodecimo.

We are glad to see this little volume. Although intended chiefly for the medical practitioner and student, it will be found oftentimes exceedingly convenient and useful by the apothecary. A large majority of the apothecaries of this country have but a slight acquaintance with the Latin language, and those who have acquired some familiarity with it, as taught in school, are at fault among the terms and abbreviations peculiar to medicine. Most American physicians have abandoned the habit of clothing their prescriptions in a Latin garb, except so far as the *Materia Medica* is concerned, and were it not for a few, whose love of the ancients induces them to affect a classical medium of communication with the apothecary, together with those foreign physicians who have settled among us, and whose common habit has been to use the Latin tongue, we might almost

say that the *necessity* of a knowledge of the language by the American apothecary had ceased to exist.

The chapter on abbreviations is well worthy the attention of both physicians and apothecaries, and those chapters applying the rules of syntax to prescription writing, and giving rules for the pronunciation of scientific terms, are equally so. The second part of the work consists of a series of abbreviated Latin prescriptions, followed by the same written in full with their literal translation; from the recent newspaper developments, some of our practitioners would find a careful study of this portion of the book, a useful preliminary preparation to appearing before coroners' juries. There are other points of interest and usefulness in the book, which, in connection with what have been noticed, claim for it a place in the library of every pharmaceutical student.

New Remedies: with formulæ for their administration. By ROBLEY DUNGLISON, M. D., *Professor of the Institutes of Medicine, etc.* Sixth edition, with extensive additions. Philadelphia, Blanchard & Lea. 1851.—pp. 755.

No more certain evidence need be asked in favor of the encouragement received by the publishers of Medical literature in the United States, than the rapid succession in which editions of standard works are called for. The work before us has passed through six editions, and its size has been much augmented. The object of the work appears to be to gather into an alphabetically arranged collection, the pharmaceutical and therapeutical discoveries and improvements that are first presented in the Journals of the day, so that the student, who rarely has more than a limited access to these, may see what has been brought forth by the most recent experimenters and discoverers in all parts of the world. The great learning of the author, and his remarkable industry in pushing his researches into every source whence information is derivable, has enabled him to throw together an extensive mass of facts and statements, accompanied by full references to authorities; which last feature renders the work practically valuable to investigators who desire to examine the original papers. The intention of the author appears to be, to present to the fullest extent the latest researches of others, without any attempt to question, modify, or improve, their results and statements, resting them solely on their own merits. By so doing, he has saved himself a world of trouble, and has left the field open to all enquirers who may be disposed to call in question any of the facts, etc., set forth in his pages.

The author observes in the preface, "The Therapeutical agents now first admitted in this work, some of which have been newly introduced into pharmacology, and the old agents brought prominently forward with novel applications, and which may consequently be regarded as *New Remedies*, are the following: Adansonia Digitata, Benzoate of Ammonia, Valerianate of Bismuth, Sulphate of Cadmium, Chloroform, Collodion, Canthari-

dal Collodion, Cotyledon Umbilicus, Sulphuric Ether, Strong Chloric Ether, Compound Ether, Hura Braziliensis, Iberis Amara, Iodic Acid, Iodide of Chloride of Mercury, Powdered Iron, Citrate of Magnetic Oxide of Iron, Citrate of Iron and Magnesia, Sulphate of Iron and Alumina, Tannate of Iron, Valerianate of Iron, Nitrate of Lead, Lemon Juice, Citrate of Magnesia, Salts of Manganese, Oleum Cadinum, Arsenite of Quinia, Hydriodate of Iron and Quinia, Sanicula Marilandica, and Sambul." The following items are quoted from the newer portions of the work.

"*Bismuthi Valerianas* is formed by mixing a neutral solution of Nitrate of Bismuth with Valerianate of Soda, [also in solution] washing the precipitate with water, and drying with a gentle heat. It forms a white powder which is insoluble in water; and has been recommended by Righini in gastrodynia, chronic gastralgia, and especially in neuralgia and nervous palpitation.

The dose is from half a grain to two grains, three or four times a day, in the form of powder or pill.

"*Ferri et Alumina Sulphas*, Sulphate of Iron and Alumina. This salt has been introduced, by Sir James Murray, of Dublin, as a valuable addition to the class of astringent remedies. The *bisulphate of iron and alumina*—as he terms it—is readily made by treating *bicarbonated solution of soft iron (!)* and *carbonated solution of pure washed alumina (!)* with *sulphuric acid*, after separating the arsenic and other ingredients which are too often found in the vitriolic acid of commerce."

One cannot but *admire* the *very lucid* language in which Sir James has couched his communication for the public benefit. It savors strongly of a quackish spirit, and possibly it will only be found that the preparation of Sir James possesses the marked curative powers attributed to the salt by him in chronic diarrhoea, dysentery, cholera morbus, leucorrhoea, epistaxis, etc. etc. When men pretend to make known remedies, they should do it in the clearest expressions they are capable of using: the days of alchemical mystifications have passed away.

We perceive among the "new remedies" Leucolein, an artificial alkaloid obtained from coal tar, and which has been shown to be identical with the Cincholeina or Quinoleina obtained from the alkaloids of cinchona by distilling them with potassa. It is a colorless substance, having an oleaginous consistence, sp. gr. 1.081, is slightly soluble in water, and miscible in all proportions with alcohol ether and the essential oils. Wertheim prescribed it as a sulphate. Its most evident effect is on the pulse, which it depresses, like conia, but under different circumstances. Its therapeutical powers have not been much investigated.

Reasoning from what is already known of chemical remedies, the numerous new substances brought to light almost daily by the researches of chemists, will afford a wide field for the occupation of the experimental therapist. Personally we have no objection to the multiplication of new remedies, because, although they often give the apothecary trouble, and cause out-

lays never redeemed, they are also sources of scientific and pecuniary interest to him ; but we cannot but view that "longing after something new," which induces some practitioners to neglect standard and well understood agents, as one of the evidences of the uncertainty of Medicine.

THE CAVENDISH SOCIETY.—Perhaps many of our readers are not aware of the existence of this Society, much less of the advantages from membership in it. It is one of a number of associations that have sprung into existence within a few years past, in England with the object of promoting the circulation of scientific literature. The design of the CAVENDISH SOCIETY, bearing as it does the name of an eminent chemist of the last century, has more specially a chemical direction. The following extracts from the laws of the Society will afford an explanation of its intentions.

"I. The Cavendish Society is instituted for the promotion of Chemistry and its allied Sciences, by the diffusion of the literature of these subjects.

"II. The Object of the Society will be effected by the translation of recent works and papers of merit ; by the publication of valuable original works which would not otherwise be printed from the slender chance of their meeting a remunerating sale ; and by the occasional republication, or translation, of such ancient or earlier modern works as may be considered interesting or useful to the Members of the Society.

"III. The Society shall consist of an unlimited number of members.

"IV. The subscription constituting a Member shall be one guinea ; to be paid in advance on the 1st day of January in each year ; for which he shall be entitled to a copy of every work published by the Society for the year for which he subscribes.

"V. The Officers of the Society shall be elected from the Members ; and shall consist of a President, twelve Vice Presidents, Treasurer, Secretary, and a Council of sixteen. The power of framing by-laws, and of directing the affairs of the Society, shall be vested in the Council.

"XVI. The Council shall select the works to be published by the Society, and shall make all arrangements, pecuniary or otherwise, in regard to editing, translating, preparing works for the press, printing, &c.

"XXI. Members shall have the privilege of proposing works for publication, and shall address their propositions to the Council.

"XXIII. No Member shall be entitled to receive the Society's publications unless his annual subscription shall have been duly paid.

"XXIV. The works of the Society shall be handsomely printed on an uniform plan for Members only."

At the annual meeting of the Cavendish Society held in London, on the 1st of March last, the following officers were elected, viz :

President—Professor Graham, F. R. S.

Vice Presidents—Arthur Aikin, F. G. S., Professor Brande, F. R. S., Earl of Burlington, F. R. S., Sir James Clark, M. D., F. R. S., Professor T. Clark, M. D., Walter Crum, F. R. S., Michael Faraday, D. C. L., F. R. S.,

J. P. Gassiot, F. R. S., Sir Robert Kane, M. D., F. R. S., W. A. Miller, M. D., F. R. S., Richard Phillips, F. R. S., Professor Wheatston, F. R. S.

Council—Jacob Bell, M. P., F. L. S., Warren de la Rue, F. R. S., Golding Bird, M. D., F. R. S., W. Ferguson, F. C. S., J. J. Griffin, F. C. S., A. W. Hoffman, Ph. D., F. C. S., G. D. Longstaff, M. D., F. C. S., T. N. R. Morson, F. L. S., Jonathan Pereira, M. D., F. R. S., R. Porrett, F. R. S., R. H. Semple, M. D., W. Sharpey, M. D., F. R. S., Alfred S. Taylor, M. D., F. R. S., Charles Tomlinson, Esq., Robert Warrington, F. C. S., A. W. Williamson, Ph. D., F. C. S.

Treasurer—Henry Beaumont Leeson, M. D., F. R. S.

Secretary—Theophilus Redwood, Esq.

The works heretofore issued by the Society are as follows:

- For 1848.—1. Chemical Reports and Memoirs. Edited by Thomas Graham, F. R. S. (out of print.)
 2. Hand-book of Chemistry. By Leopold Gmelin, translated by Henry Watts, B. A., F. C. S. Vol. I.
- For 1849.—3. Hand-book of Chemistry. By Leopold Gmelin. Vol. II.
 4. “ “ Vol. III.
 5. The Life and works of Cavendish, by Dr. George Wilson.
- For 1850.—6. Hand-book of Chemistry. Vol. IV.
 7. “ “ Vol. V.

The works under way for 1851, are Lehmann's Physiological Chemistry, translated by Dr. Day; and the 6th volume of the Hand-book, which will complete the inorganic part of this work.

The accession of members has not been as rapid as might have been anticipated from the object in view, but their number has been steadily increasing, and at present amounts to 854. As the extent of the operations of the Society is limited only by the amount of subscriptions, the individual advantages to the members is in direct proportion to their number. For instance: the cost of translating, editing, and setting in type any work is the same for 1000 copies, as for 5000. The only additional charge for the extra 4000 copies, would be the paper and press work. Consequently 5000 members could be supplied with copies for a small advance on the expense required for supplying 1000 members, and the surplus funds yielded by the greater number of subscriptions, would enable the Society to prepare and publish several other works, all of which would be furnished to the members without additional cost. Hence it is of the utmost importance to increase the list, and with this view the Council have appointed Honorary Secretaries throughout the provincial towns of Great Britain and Ireland, who interest themselves in the Society's behalf by extending a knowledge of its object and usefulness. Already there are several members in this country. At a late meeting last year, the Council determined to facilitate the acquisition of American Members by creating an Honorary Secretaryship in the United States, and have since appointed the Editor of this Journal, with his previous consent, to fill the Secretaryship for Philadelphia: from whom, further information, interesting to those who desire to avail themselves of the advantages of the Society, may be obtained.

LECTURES IN THE

PHILADELPHIA COLLEGE OF PHARMACY.

Thirty-first Session of the School of Pharmacy, 1851-52.

The Lectures in this institution will commence on Thursday, October 16th, and terminate about the middle of March. They will be held in the Hall of the College, Zane street, on Tuesdays, Thursdays, and Saturdays, two lectures each evening at 7 and 8 o'clock.

ROBERT BRIDGES, M. D., General Chemistry.

WILLIAM PROCTER, Jr., Theoretical and Practical Pharmacy.

ROBERT P. THOMAS, M. D., Materia Medica.

The lectures on CHEMISTRY will embrace in a systematic view the laws, operations and results of this science, and its relations to Pharmacy. The elements concerned in inorganic nature, and their compounds, will receive such notice as their relative importance in this respect demands; and will be illustrated by experiment, diagram, specimens, and processes.

Organic chemistry will also receive its full share of attention, and all its compounds, possessing general or pharmaceutical interest will be brought under consideration in a similar manner.

The lectures on PHARMACY will treat, of the elementary operations required in the preparation of medicines; viz., weights, measures, and specific gravity, the management of heat, the manipulations in the processes of pulverization, solution, evaporation, distillation, crystallization, &c.; all illustrated by the most approved models, diagrams and apparatus.

The pharmaceutical preparations of organic drugs will be considered as follows; viz. The simple preparations of each drug will be noticed under the head of that drug, and each compound preparation under the head of its chief constituent. Each class of preparations as tinctures, extracts, plasters, &c., will receive a general notice in its proper place. The classification of the subjects will be in groups founded on the nature of their chief constituents; these may be starch, gum, sugar, resin, volatile oil, fixed oil, tannin, alkaloids, etc., each group being prefaced by a general description of the principle or principles giving it name. The preparations of each drug will be preceded by such notice of its chemical constitution, as will exhibit the kinds of treatment best calculated to extract and preserve its active portion.

The course will conclude with the processes for those inorganic chemicals which may be prepared by the apothecary himself, when desirable, without any reference to their systematic chemical relations.

The lectures on MATERIA MEDICA will be exclusively devoted to vegetable and animal substances, their origin, commercial history, characters, composition, and medical properties, together with their adulterations and the means of detection. The course will be commenced with three lectures on the elements of botany, and will be made practical and demonstrative by the exhibition of an extensive collection of the substances, their varieties and falsifications, aided by accurate drawings, and a full series of exotic and indigenous plants in their dried state.

Experiments illustrative of the proximate organic principles and modes of their detection, with the difference between genuine and spurious articles, will be introduced whenever deemed interesting or important.

QUALIFICATIONS FOR GRADUATION.—Every person upon whom a diploma of this college shall be conferred, must be of good moral character, must have arrived at the age of twenty-one years, have attended two courses of each of the lectures delivered in the college, or one course in the college,

and one course in some other respectable school of pharmacy, and have served out an apprenticeship of at least four years, with a person or persons qualified to conduct the Drug and Apothecary business; of which circumstance he must produce sufficient evidence to the Board of Examiners.

He shall also be required to produce an original dissertation, or thesis, upon some subject of the materia medica, pharmacy, chemistry, or one of the branches of science immediately connected therewith, which shall be written with neatness and accuracy, and with the evidence of apprenticeship, be deposited with the senior professor of the school, on or before the twentieth of February, of the session in which the application shall be made. He must also be recommended in writing by the Committee of Examination and the Professors jointly, and if his application be finally approved of by the Board of Trustees, he shall, upon payment of five dollars to the treasurer, receive the diploma of the college.

FEES.—The matriculation fee is *two* dollars, payable to the Secretary of the Board of Trustees, and the price of tickets is *eight* dollars for each course, payable to the professors respectively. The fee for the Diploma is *five* dollars. Students who have previously matriculated, and all who are apprenticed to members of the college, are exempt from the matriculation fee, but they must invariably obtain the matriculation ticket before the commencement of each course. Graduates and members of the college, and all students who have paid for two full courses of instruction in the college, are admitted to the lectures gratuitously.

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AMERICAN JOURNAL OF PHARMACY.

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OCTOBER, 1851.  
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OBSERVATIONS ON THE SASSY BARK OF WESTERN AFRICA AND ON THE TREE PRODUCING IT.

BY WILLIAM PROCTER, JR.

Various travellers, from the celebrated Mungo Park to the more recent explorers of Western and Central Africa, have alluded in their narratives to the use of a poisonous bark as an ordeal to which persons suspected of witch-craft, secret murder, and other crimes in the code of those countries, are subjected, as a test of their innocence or guilt. In Congo, it is known as the "ordeal bark," and in Ashantee and the neighboring settlements of Liberia, as "doom bark," and the process of its administration as "taking doom." It is also said to be resorted to as a means of gratifying private revenge, an application to which its chemical nature readily admits, and its use, in the opinion of the missionaries, is a great moral evil worthy the attention of the philanthropic.

Moses Sheppard, Esq., of Baltimore—a gentleman whose interest in the welfare of the African race has, for many years past, connected him, as a patron, with the Colonization of Western Africa, at Liberia—several years since received from Dr. Samuel F. McGill, of Cape Palmas, a few pounds of *sassy* bark, a portion of which was given to Mr. Charles A. Santos, now of Norfolk, Va., who published an account of its physical, and some of its chemical properties, in this Journal, vol. xxi, p. 97.*

More recently, Mr. Sheppard placed in my hands about two pounds of the bark for examination, but feeling a reluctance to devote time and labor to the investigation of a product, the botanical source of which was unknown, that gentleman kindly offered

* Mr. Santos calls it *saucy* bark. *Sassy* is the term used by Dr. McGill.

to obtain for me, through his friend Dr. McGill, specimens of the leaves, flowers, and fruit of the sassy tree. About nine months ago a box was received from Liberia containing the leaves, fruit, twigs, wood and bark of the sassy tree, but the flowers, the most important part, were omitted, as the tree was then in fruit. As the flowers then promised have not yet arrived, I have concluded to publish what facts have been collected from travellers, together with those derived from an examination of the specimens.

The tree producing sassy bark has not been described in any of the botanical works in the library of the Academy of Natural Sciences of Philadelphia, including DeCandolle, Lindley and Endlicher, and in the narratives of travellers so little attention has been given to the means of identifying it, that the specimens themselves, imperfect as they are in the absence of the flowers, will afford more light than can be obtained from any other available source.

In Bowditch's *Ashantee*, page 279, the following paragraph is found :

"Taking doom is the infallible test, when they consider the case too doubtful for human decision. The bark of that tree, (viz : the "doom plant,") is put into a large calabash with water, so as to make a strong infusion ; it is stirred up, while the suspected parties sip in turn. It operates instantly and convulsively as a most violent emetic and purge. Those who sip first may recover, and the dregs are frequently left designedly for the obnoxious."

In Tuckey's narrative of a voyage to the river Congo, page 185 : "This morning Gangam Kiskey (the public accuser and executioner) returned, and we learned that he had denounced three men of another village as the poisoners of the man that died, and the accused were immediately to undergo the ordeal of chewing the poisonous bark, which, if they were guilty, they would retain in the stomach, and this would occasion death, but if innocent, they would vomit."

Ibid, page 200.—"It appears that the bark used in the ordeal is from a species of *Cassia*."

Ibid, page 329.—"The bark and leaves of the *Cassa* tree, which Gangam Kiskey made use of as an ordeal, were brought to us. They are said to be poisonous."

Bruce, in his *Travels*, (vol. v. p. 27, quarto edition,) describes

a tree called "sassa," which yields the *sassa gum* of African commerce, and he gives two figures which represent the leaves and flowers. The tree is very analogous in general appearance to that of the sassy bark, flowering in a terminal raceme, with bipinnate leaves, the folioles of which, however, are opposite, whilst those of the sassy are alternate. This tree is the Inga Sassa of Willdenow. (Decandolle.)

In the appendix to Tuckey's voyage, &c., it is stated that "One of the unpublished genera is *Erythrophleum*, the *red-water tree* of Sierra Leone, *another species of which is the ordeal plant or cassa* of the natives of Congo." This remark is more to the point than any that has been found, because as Sierra Leone is near the locality whence the sassy bark is derived, and as there is strong reason for believing the cassa bark of Congo (why not sassa or sassy as a derivation or corruption?) and sassy bark to be identical, the former of which is attributed to a leguminous tree, said to be a species of *Erythrophleum*, (vid. ante) is it not reasonable to refer the sassy bark tree of Cape Palmas to the same genus, or at least to one nearly allied, and perhaps not yet described?

Lindley, in his last edition of "The Vegetable Kingdom," places the genus *Erythrophleum* of Afzelius in the Natural Order, FABACEÆ, sub-order MIMOSEÆ, and tribe PARKIÆ.

Endlicher, Genera Plant, page 1323, characterizes the genus *Erythrophleum* of Afzelius thus:—"Flores hermaphroditi, regulares. Calyx quinquefidus subimbricatus. Corollæ petala 5. Stamina perigyna. Legumen compressum, bivalve, polyspermum. Arbor Africæ tropicæ, excelsa; foliis bipinnatis, foliolis oppositis; racemis terminalibus et lateralibus." This agrees with the specimens of sassy, as far as they go, except in the position of the folioles, which will now be described.

The sassy bark is produced by a large tree with spreading branches. In the general appearance of its fructification and foliage it resembles the *Gymnocladus* of the United States. The leaves (*a*) are bipinnate, the pinnae are articulated oppositely on the general petiole, and vary from three to six or seven on a side, according as they are taken from near the terminus of a branch or below; in the last case they are larger, and generally the pinnae nearest the apex are largest. The folioles are subpetiolate, obliquely ovate, and acuminate, from one to three inches

long and from one to one and a half wide, alternate, smooth, entire, sometimes slightly repand, and varying from three to five or six on a side, one being terminal. The bark of the younger branches and twigs, which is dark gray, is covered with light colored dots, which extend to the receptacles on the raceme.

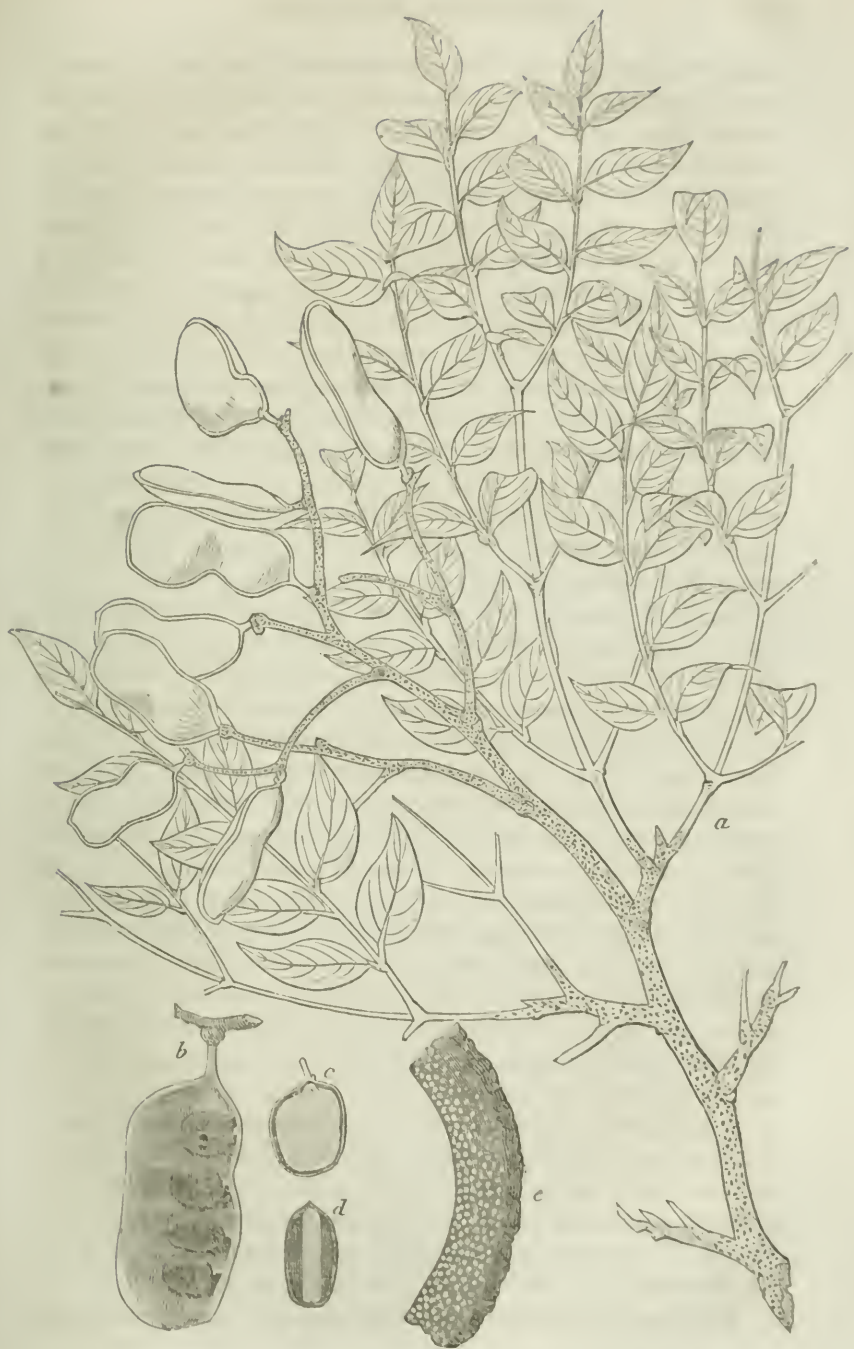
The legume (*b*) is from two to four inches long, and from one to two wide, violin shaped, of a dark chestnut color, coriaceous, compressed, obtuse at both ends, bivalved, containing from two to five seeds attached by short funiculi, and dehisces by the dorsal suture. The legume contains considerable tannin. The seeds have an oblong oval, flattened form, are black except the hilum, which is brown, smooth and covered with a dry gummy transparent substance, analogous to cerasin, which is dissolved by boiling water, and forms a colorless solution, from which it is precipitated by subacetate of lead, sesqui-chloride of iron and alcohol.

The seed has a hard, horny episperm, and a tough, horny, light grey albumen (*d*), nearly surrounding the cotyledons, and composed of a bassorin-like substance, which swells in boiling water, and becomes translucent like tragacanth. The (*c*) cotyledons are large, compressed, indurated, and yellowish green colored. They have a disagreeable taste, contain chlorophylle and fixed oil, in small quantity, but no starch, nor has this principle been found in any part of the plant.*

The tree must be large, as the section of a branch three inches in diameter exhibited the bark but one-sixteenth of an inch thick, grey colored, while the bark used for poisoning is from three to five-eighths of an inch thick. The young wood has a greyish white color, and is not very dense.

Sassy bark is taken from the trunk and larger branches. The specimens last sent by Dr. McGill are from a younger tree than those first received. The former was in pieces from four to ten inches long, all more or less curved, and exhibiting the mark of the knife at the ends, with some indication of dried sap on the cut surface, and about four lines thick. The exterior is slightly fissured longitudinally, and has lichenoid matter attached. The older bark has the epidermis removed in most of the pieces, and has a dark brown ferruginous color. The internal structure of the bark it

* In the figure there are several defects committed by the artist. The bark should be grey colored with light colored dots, the leaflets should have been rather larger in proportion to the petiole. The large leaves spoken of in the text are attached at the base of the shoots to which the leaves are attached in the figure.



a, Sassy bark tree. *b*, *c*, *d*, Legume and seed. *e*, Section of the bark.

quite peculiar. A smooth transverse section (*e*) exhibits numerous round, fawn-colored spots, surrounded by a reddish-brown cellular tissue. These spots are sections of cylindrical bodies, varying from one-half to two lines long, compact, brittle and very dense, sinking rapidly in water, and are most numerous in the oldest bark and near the inner surface. The spec. grav. of the bark in mass, according to Santos, is 1.054. Sassy bark has a slight not very marked odor, and an astringent taste, without bitterness. This astringency, which is due to tannic acid, resides exclusively in the reddish colored portion, a fact easily shown by applying with a camel's hair brush, a dilute solution of sesquichloride of iron, to a transverse section. The fawn-colored spots will remain intact while the surrounding tissue is dyed deep black. Sassy bark breaks with an abrupt fracture, and is readily disintegrated. The dust, when inhaled by the nose in the act of powdering, causes long continued spasms of sneezing, occupied with distress about the forehead and eyes.

Chemical Examination of Sassy Bark.—It is stated in the works of systematic botanists that the secretion of tannin and gum is a marked feature of that portion of the Leguminosæ included in the *sub-order* Mimoseæ, of which the Acacias may be quoted as an example. The intermediate *sub-order* Cæsarpineæ is also largely characterized by species abounding in tannin, of which the Hæmatoxylon may be instanced. The sassy bark tree is largely tanniniferous, and the bark might be used for tanning purposes in its native country. Gum does not exist largely in the bark, but, as has been said, is found in and around the seed; and as it is probable that the gum-bearing character of the Acacias may be due more to disease, or to an interruption of the normal condition of the circulation of the trees by punctures or incisions, than to an overflow or superabundance of that principle; the comparative absence of gum from sassy bark is no reason why it should not rank in that sub-order.

A thousand grains of the bark, in powder, moistened with water, was put into a glass percolator, and half a pint of strong infusion obtained by pouring water slowly on the bark. This was set aside, and the additions of water continued during two days, until the fluid passed tasteless and colorless. The residue dried at the temperature 90°—100° F., weighed 840 grains.

The clear infusion had a dark red color, and was not coagulated

by heat. Sesqui-chloride of iron caused a flocculent precipitate of a greyish black color. Neutral acetate of lead, proto-chloride of tin, bichloride of mercury, and sulphuric acid, produce copious precipitates, and a solution of gelatin, affords a flocculent deposit. These tests indicate *tannic acid* in abundance; but its reaction with the persalts of iron and tartar emetic, the latter causing only a slight opalescence, indicate one of the modified forms of that acid.

When the tannin was removed from the infusion by gelatin in excess, and the liquid filtered, sesqui-chloride of iron caused a black coloration, which disappeared by heat. When the infusion was treated with a solution of neutral acetate of lead to remove the tannin and coloring matter, the filtered liquid afforded but a slight precipitate with subacetate of lead, indicative of but little soluble gum.

The residue of the sassy bark, after exhaustion with cold water, was boiled in water, and the transparent decoction filtered hot. As it cooled, a deposition of brownish red apotheme occurred, which was soluble in diluted alcohol and alkaline solutions, had but little taste, and that slightly astringent, due perhaps to a little unaltered tannin adhering, as it was colored blackish brown by sesqui-chloride of iron. This altered tannin exists in considerable quantity, as will be shown in a following experiment.

The cold decoction was not colored blue by solution of iodine.

The dried residue of the sassy was then exhausted with cold alcohol by displacement, yielding a dark kino-colored tincture, from which water precipitated a reddish brown substance. This tincture was evaporated to dryness, the residue reduced to powder, and a portion exhausted by chloroform, which left a brown residue soluble in alkaline liquids and diluted alcohol. The chloroform solution by evaporation deposited a mixture of fatty matter and resin both in small quantity.

Five hundred grains of the bark in powder was displaced with commercial ether, so as to obtain six fluid ounces, and the tincture evaporated to dryness spontaneously. This extract, which had a deep red color, was nearly all soluble in alcohol. It was treated with cold water, which softened it, dissolved out the tannin, and acquired a reddish color. The extract was malaxated with repeated quantities of water until it ceased to lose weight. The residue was boiled in repeated portions of water till it was exhausted by that menstruum. The residue was soft and fusible at 212° F.,

had little odor, was soluble in alcohol, and burnt with a sooty flame, with a large carbonaceous residue. This was then treated with chloroform by trituration and thrown on a close filter; the larger part was dissolved, forming a light brown solution, which yielded a soft, brownish, matter by evaporation. This substance fused by a gentle heat, caused a greasy stain on heated paper, and was dissolved by warm solution of potassa, from which muriatic acid precipitated it in minute brownish globules, and is a mixture of resin and fatty matter. The undissolved portion left on the filter was apotheme, dissolved by the alcoholic ether first used. It was a brownish red powder, soluble in alcohol, insoluble in anhydrous ether and cold water, but dissolved partially by boiling water, and by solution of potassa, and swells up without disposition to inflame when heated.

The residue of bark left by the ether was extracted with alcohol, and this evaporated to dryness. This extract was exhausted with water and dried. The residue was completely insoluble in chloroform, swelled up when heated, was partly soluble in boiling water, very soluble in diluted alcohol and in alkaline solutions, and consisted almost wholly of a substance allied to the apotheme of *Krameria triandra*.

3500 grains of sassy bark in coarse powder, was exhausted by alcohol, .835 by maceration and percolation, and the tincture evaporated on a water bath to a soft extract, weighing 950 grains, which was used as the basis of a series of experiments for the active principle.

a. 200 grains of alcoholic extract of sassy was triturated with 120 grains of calcined magnesia, and sufficient water to effect the combination of the tannin and coloring matter with that earth, and then dried at 212° . The mass, reduced to powder, was exhausted with boiling alcohol, and the liquid evaporated to half an ounce and set aside. As the liquid disappeared by spontaneous evaporation, an oil-like matter separated on the sides and surface.

b. 200 grains of the same extract was treated in the same manner with 200 grs. of lime, previously hydrated. As the alcoholic liquid evaporated, the same oily-looking matter was eliminated.

c. 200 grains of the extract was treated with 100 grains of hydrated protoxide of lead, (carefully freed from alkali by washing) in the same manner as a. and b. and on evaporating the alcoholic liquid the same product was obtained.

This substance is very soluble in alcohol, soluble in ether and chloroform, and but slightly soluble in water. Its alcoholic solution slowly restores the color of reddened litmus, but when heated with very dilute hydrochloric acid, it was not dissolved. Its solution in boiling water afforded a curdy precipitate with tannic acid. When heated to redness on glass or platina, a minute ash of white color remains, which is alkaline in its action on moist reddened litmus. It has little if any odor or taste, and a grain of it given to a cat, produced no poisonous effect, and consequently it is not the active principle. An analogous experiment of Mr. Santos (*Am. Jour. Pharm.* vol. xxi. p. 100,) yielded him "a few grains of a crystalline matter, having a white colour and nauseating taste," which the paragraph following states was poisonous when tried on animals.

200 grains of the same alcoholic extract was triturated with half a pint of water, filtered, and the clear reddish brown solution filtered and refiltered through a layer of purified animal charcoal, previously boiled in alcohol. The charcoal was then washed, dried, treated with boiling alcohol, and this evaporated. A reddish brown amorphous residue was left without any indications of crystals, as obtained by Mr. Santos when a weak tincture was thus treated.

5000 grains of the bark in powder was exhausted with cold water by maceration and displacement, the coloured astringent infusion precipitated with subacetate of lead, and the excess of lead removed from the colourless liquid by sulphuric acid carefully added. The filtered liquid was evaporated on a water bath; before acquiring a syrupy consistence tufts of crystals separated, which were removed and set aside. The evaporation was continued and the residue treated with boiling alcohol, which on evaporation yielded a brownish, syrupy, deliquescent substance, exhibiting no disposition to crystallize. A portion of this given to a cat produced no symptoms of poisoning.

The crystalline matter which consists of sulphate of lime and an organic salt of lime, has not been sufficiently examined.

From the foregoing observations it is apparent that neither of the substances described is the active principle. I am convinced that when isolated it will be found to possess great activity, as three grains of the aqueous extract of sassy, given to a cat, caused violent poisonous symptoms, great prostration, frothing at the mouth,

moaning, dilatation of the pupils, and total indisposition for food. Another series of experiments are now in course, the results of which will be tested physiologically; but as they cannot be concluded 'in time for this essay, they will, if successful, form the subject of a future communication.

The organic substances detected are tannin, an insoluble apotheme analogous to those in *Krameria*, and a combination of these, which constitutes the red coloring matter of the bark, gallic acid, gum, resin in small quantity, fatty matter, and a peculiar matter precipitable by tannin, and soluble in alcohol and chloroform, but which is not the active principle.

Inorganic constituents of Sassy bark.—2000 grains of the bark in small fragments, was charred and partially incinerated in an earthen crucible, and the incineration afterwards completed in a platina crucible, using a green glass rod to stir the contents occasionally. Sixty grains, or three per cent. of a light colored grey ashes resulted.

The ashes were treated with boiling distilled water in successive portions till exhausted; the filtered lixivium, which was alkaline to test paper, yielded by evaporation 3.6 grains of a white amorphous residue. This was dissolved in water, neutralized with nitric acid, which caused effervescence, and filtered.

The clear solution afforded no precipitate with ammonia, potassa, or their carbonates, oxalate of ammonia, ferrocyanuret of potassium, hydrosulphuret of ammonia, or with phosphate of soda and ammonia.

When a portion of the solution was evaporated, it yielded crystals of nitrate of potassa. A solution of tartaric acid caused the gradual production of a white crystalline precipitate of bitartrate of potassa, and bichloride of platinum a yellow one in octohedrons.

Nitrate of silver threw down a white precipitate, soluble in ammonia, and nitrate of baryta a white dense one insoluble in nitric acid.

The soluble portion of the ashes therefore contains, *carbonate and sulphate of potassa, and chloride of potassium*, without lime, magnesia or iron associated.

The portion of the ashes insoluble in water, was treated with diluted muriatic acid, which dissolved nearly all with violent effer-

vescence, and then evaporated to dryness. The dry mass was treated with boiling distilled water thrown on a filter, the greenish grey residue washed with distilled water, and the washings added to the first liquid, which was perfectly colorless. This was divided into two parts and one set aside.

This solution when much diluted, was not precipitated by caustic ammonia or potassa, but when not diluted, these reagents and their carbonates produced abundant white precipitates. Phosphate of soda caused a bulky white precipitate, soluble in muriatic acid. Oxalic acid and oxalate of ammonia each produced white granular precipitates soluble in nitric acid. Sulphuric acid caused no precipitate in the dilute solution, but an abundant crystalline one when stronger. All the tests indicated lime in abundance.

When the lime was separated by muriate and carbonate of ammonia, the filtered solution yielded no precipitate with phosphate of soda and ammonia. Chloride of barium caused no change. Hydrosulphuret of ammonia produced a slight black precipitate and ferrocyanuret of potassium, after standing a while, caused a slight white deposit, but no evidence of iron.

The reserved half of the solution obtained from the ashes, was then treated with an excess of solution of oxalic acid, and after the deposition of oxalate of lime ceased, it was collected, washed, dried, and ignited at a dull red heat, and the resulting carbonate of lime was found to weigh twenty-one grains, equal to forty-two grains from the whole of the bark treated, or about two per cent. It is probable that the greater part of the lime exists in the bark in combination with a vegetable acid as the ashes, which were obtained by gradual incineration, at a comparatively low temperature, contained the lime as carbonate. A portion of the lime probably exists as phosphate.

The portion of the ashes left on the filter after treatment with diluted muriatic acid and distilled water, was heated in strong muriatic acid, which dissolved all but a little silica and grit, and acquired a greenish yellow color. This solution when diluted, gave evidence of iron by ferrocyanuret of potassium. It was then boiled with acetate of soda and acetic acid, and the gelatinous precipitate of the phosphate of iron dissolved in muriatic

acid and heated with an excess of potash, by which the iron as sesqui-oxide, was precipitated. The liquid left afforded no precipitate of alumina with an excess of acetic acid.

The insoluble portion of ashes consists chiefly of carbonate and phosphate of lime, phosphate of iron, and silica, without magnesia or alumina.

ON LIQUOR FERRI NITRATIS U. S. P., 1850; AND ON A FORMULA
FOR SYRUP OF PROTO-NITRATE OF IRON.

BY WILLIAM PROCTER, JR.

The instability of the so called "solution of sesqui-nitrate of iron" is proverbial, and several attempts have been made to render it sufficiently permanent, to be at all times relied on. The formula of the Dublin Pharmacopœia of 1850, which is virtually that of Mr. Kerr of Scotland, has been adopted in the United States Pharmacopœia, with a slight alteration, rendered necessary by the different value of the weights and measures of the two codes. The manipulation is the same, viz., to dilute the acid with about five times its bulk of water, and add it to the iron at once, leaving them in contact until the reaction ceases, which is usually stated at twelve hours. The solution thus prepared, has, after filtration and dilution, a dark reddish brown color, and is precipitated black by ammonia, which indicates clearly that the iron is not entirely sesqui-oxidized, and that the solution is a mixture of the proto and sesqui-nitrates of iron.

When this solution is suffered to stand, either in close or open vessels, it gradually becomes opaque, and deposits an ochreous sediment, which ceases after a length of time, whilst the liquid has acquired a much lighter color, is transparent, and is precipitated in brownish red flocks by ammonia, without any admixture of black. The ochreous precipitate is probably a basic, or sub sesqui-nitrate, several of which are known to exist, and one of which, according to Grouville (Gmelin's Hand b; vol. v., p. 269,) has the formula $4 \text{Fe}_2 \text{O}_3, \text{NO}_5 + 2\text{H}_2\text{O}$. The proportion of this subsalt that will precipitate from the officinal solution, depends

on the proportion of proto-nitrate existing in the preparation when filtered from the excess of iron, it being greater as the amount of the proto-salt is greater. If the solution is filtered off from the excess of iron as soon as the reaction has ceased to be active, it will contain much less of the proto-nitrate, than if the contact continues for a length of time (12 hours). The reason of this appears to be, that a portion of iron is oxidized, and dissolved at the expense of the acid of the ter-sesquinitrate, reducing a part of that salt to the condition of an insoluble subnitrate, which salt is subsequently increased in quantity at the expense of the proto-nitrate, by its gradual conversion into ter-sesqui-nitrate, which remains in solution, and sub-sesquinitrate which precipitates.

If, however, instead of proceeding according to the officinal directions, the nitric acid is diluted to the sp. gr. 1.15 and the iron, in the form of iron wire, as card teeth, be gradually added, so that the active reaction nearly ceases after each addition, till it is saturated, and then filtered, a solution is obtained containing a much smaller proportion of the proto-nitrate. If now this is heated gently, and nitric acid is slowly dropped in, stirring after each addition until the solution yields a reddish brown precipitate with ammonia, the solution is entirely free from the proto-nitrate, and has a much lighter color. The slight excess of nitric acid that exists in the solution thus prepared, is, therapeutically considered, probably an advantage. Dr. Bache, (U. S. Dispensary, 9th edit., page 100S,) suggests that "a permanent solution might be prepared by dissolving moist hydrated sesqui-oxide of iron in nitric acid to saturation." This suggestion, however correct in theory, is not easily practised, because, after sufficient of the oxide is dissolved to form a true ternitrate, the dissolution of the oxide continues until a large portion of sub-sesqui-nitrate is formed, and unless the exact proportions of acid and base are used, the operator has no clue to guide him in the process.

The following modification of the officinal direction is offered as yielding a true sesqui-salt in solution, and of equal strength with that of the Pharmacopœia :

Take of Iron Wire (card teeth) cut in pieces, an ounce.
Nitric Acid (sp. gr. 1.42) three fluid ounces ;
Distilled Water, a sufficient quantity.

Mix the acid with ten fluid ounces of the distilled water in a thin wide mouthed bottle, which should be surrounded by water. Add the iron gradually, about a drachm at a time, waiting until active effervescence has ceased after each addition before making the next. When all the iron has thus been thrown in, filter the solution through paper, heat it gently in a capsule or flask, and carefully drop in nitric acid followed by stirring or agitation until a drop of the solution tested with ammonia yields a red precipitate without any tinge of black. Then add distilled water until the liquid measures thirty fluid ounces. The solution should have a bright madeira wine color.

In a paper by Mr. Augustine Duhamel (*Amer. Journ. Pharm.*, vol. xvii, July 1845,) the author states that Dr. Hays (of Philadelphia) has been using a saccharine nitrate of iron for several years. In a recent conversation with Dr. Hays, he informed me that the preparation he uses is a syrup, and does not spoil by keeping, and that it is prepared by Mr. Samuel Simes, to whom he (Dr. Hays) first suggested the protective agency of sugar in reference to nitrate of iron. All who have made the syrup of sesqui-nitrate of iron of Duhamel, are aware that it will not keep long, and a specimen in my possession exhibits nearly the whole of the iron as a precipitate. On examining Mr. Simes' preparation, it was found to be a thick syrup of a light greenish color, perfectly transparent, neutral and to yield a greenish colored precipitate with ammonia. These characters at once prove the iron to be chiefly in the form of a proto-salt protected by sugar. As Mr. Simes declines to communicate his formula for publication, and as the testimony of Dr. Hays is strong in favor of its therapeutic value, I offer the following receipt for making the preparation.

It requires a particular course of manipulation to dissolve iron in nitric acid, without a large portion passing to the higher stage of oxidation. If, however, instead of adding the iron in divided portions to the nitric acid, we add the nitric acid, more diluted, to the iron in great excess, the acid gradually becomes saturated, the solution has a light greenish color when filtered, and is precipitated of a greenish color by ammonia. It is necessary for the solution to stand on the iron for several hours after the last addition of acid.

Take of Iron Wire (card teeth) in pieces, two ounces.

Nitric Acid (sp. gr. 1.42) three fluid ounces.

Water, thirteen fluid ounces.

Sugar, in powder, two pounds.

Put the iron in a wide mouthed bottle kept cool by standing in cold water, and pour upon it three fluid ounces of water. Then mix the acid with ten fluid ounces of water, and add the mixture in portions of half a fluid ounce to the iron, agitating frequently until the acid is saturated, using litmus paper. When all the acid has been combined, filter the solution into a bottle containing the sugar and marked to contain thirty fluid ounces. If the whole does not measure that bulk, pour water on the filter until it does. When all the sugar is dissolved, strain, if necessary, and introduce the syrup into suitable vials and seal them.*

SYRUP OF PROTO-NITRATE OF IRON.

By W. W. D. LIVERMORE.

Syrup of proto-nitrate of Iron is an improved form, in which the officinal Liq. Ferri Nitratis is at present prescribed by several prominent physicians in this city; and combining as it does the advantages of the proto-salts of iron, with stability of preparation, is destined to come into general use as an active and pleasant feruginous remedy. I believe no formula for it has yet been published, and as apothecaries have found it both inconvenient and disagreeable depending upon others to prepare it by some secret recipe, the subjoined may be found a convenience.

R. Sulphate of Iron,	℥viii.
Carbonate of Soda	℥x.
White Sugar,	℥xx.
Nitric Acid, (sp. gr. 1.42) f.	℥v. and f.℥v.
Boiling Water,	
Simple Syrup, aa.	q. s.

* This paper was written and read before the Philadelphia College of Pharmacy, before Mr. Livermore's paper, following, was received—but as the same result is arrived at by different processes, both are inserted.—ED.

Dissolve the sulphate of iron and carbonate of soda, each in two pints of the water, filter, and add to each solution two ounces of simple syrup. Mix the solutions, and allow the precipitate to subside. Pour off the supernatant liquid, and wash the precipitated carbonate carefully with sweetened water, until the washings have no longer a saline taste. Collect the precipitate upon a fine muslin strainer, and with gentle pressure express as much of the water as possible. Transfer to a porcelain capsule, and add gradually the nitric acid, previously diluted with an equal measure of water. Mix the sugar with the solution, and dissolve over a water bath, stirring from time to time with a glass rod. When done, the syrup should be made to measure thirty fluid ounces, by the addition of a sufficient quantity of water.

It does not always happen that the apothecary has on hand an acid of known specific gravity, and when this is the case, it will answer to add nitric acid diluted with an equal measure of water to the carbonate of iron, until dissolved, and the solution possesses a slightly acid reaction.

This syrup contains ten grains of dry nitrate of iron, to each fluid drachm, and the dose varies from twenty to forty drops.

MEANS OF DETERMINING THE PURITY OF CERTAIN CHEMICALS AND DRUGS, AND FOR DETECTING ADULTERATIONS.

(Continued from page 106.)

Carbonate of Potassa, in its medicinal form, is a white granular powder, inodorous, and of an acrid alkaline taste, dry and not adhering to the sides of the bottle, and an alkaline reaction; very deliquescent, soluble in its own weight of water, insoluble in alcohol. At a red heat it loses sixteen per cent. of water, but no carbonic acid, and fuses into a transparent liquid. With acid it effervesces rapidly. The impurities generally present are chloride of potassium, sulphate and silicate of potassa.

Chloride of potassium is detected by supersaturating a solution of the salt with pure nitric acid, and adding nitrate of silver; a

white cloud indicates the presence of chlorine. The sulphate, by supersaturating as before, and adding solution of chloride of barium, sulphuric acid being present, a white precipitate will fall. If the solution of carbonate be very strong, a white precipitate may form on adding solution of nitrate of silver, which will disappear on dilution; this is also an indication of sulphuric acid, but not to be relied on without confirmation.

Silicate of potassa is indicated when a solution of the carbonate lets fall a gelatinous precipitate on exposure to the air. It may be detected by saturating the salt with pure muriatic acid, evaporating to dryness and heating to redness; silicic acid is left as an insoluble residue when the mass is acted on by water. The silica frequently exists in such an amount as to form a gelatinous precipitate when the salt is supersaturated with any acid. *Potassæ carbonas* should give indications with all the above tests, but not very decided. *Potassæ Carbonas Purus*, no effect. This latter salt may give indications of silicic acid when it has undergone deliquescence in a white glass bottle, from dissolving some of the silica of the glass.

Bicarbonate of Potassa.—A colorless crystalline solid, with a slight alkaline taste and reaction, with vegetable yellows. Soluble in four parts of cold water, but insoluble in boiling water without decomposition, carbonic acid being liberated; insoluble in alcohol. By a red heat it loses about 30 per cent., or all its water and half its carbonic acid. The impurities to be met with in it are sesqui-carbonate and sulphate of potassa and chloride of potassium. If sesqui-carbonate be present, a dilute solution will form a brick red or orange precipitate, with solution of corrosive sublimate; sulphate of potassa and chloride of potassium may be detected by the same means as in the carbonate.

Carbonate of Ammonia.—This salt is in hard translucent lumps of a fibrous crystalline texture; it has a strong, pungent, penetrating odor and a sharp permanent taste; its reaction is alkaline, and in consequence of the escape of a portion of its constituents, moistened tumeric paper immediately becomes brown when held over it. It is soluble in four parts of cold water, but hot water decomposes it with effervescence, carbonic acid being liberated; partly soluble in officinal alcohol; in boiling alcohol it dissolves, but also undergoes the same change as in boiling

water. It is totally volatile by the temperature of a water bath. Exposed to the air or kept insecurely, it decomposes readily, losing ammonia and carbonic acid, becoming opaque, lighter, and finally, a white crumbly mass of bicarbonate. This change occurs so easily, that when imported in stone-ware vessels not well glazed, it has become much injured. It is generally sufficiently pure for medicinal use, containing only traces of tarry matter, which gives a dark color to its solution in acids, and leaves a brownish residue when the salt is evaporated on a water bath. It becomes less fit for medicinal use as it undergoes decomposition by exposure. No portion of the salt should be used for medicinal purposes except it be clear and translucent, all that is white and opaque should be rejected, or used for those purposes only (saturation of acid, &c.) in which an excess of carbonic acid is not important.

Carbonate of Lime.—This is officinal under three forms of different purity: *creta preparata*, *testa preparata*, and *calcis carbonas præcipitatus*, the latter introduced into the Pharmacopœia of 1850.

Prepared chalk and shell are in dull white friable lumps, inodorous and insoluble in water. Acted on by hydrochloric acid, diluted with four to six parts of water, it dissolves with effervescence, forming a copious froth which does not readily subside, and the liquid contains dirty gray flocculi. The filtered liquid, much diluted, produces a slight precipitate with caustic alkali, and a copious white precipitate with oxalate of ammonia. The prepared chalk is rarely adulterated, but if not well prepared may be gritty or dirty; when mixed with water and allowed to stand a few moments, on decantation no harsh residue should have subsided; the solution in hydrochloric acid should not have in it so much flocculi as totally to obscure its transparency. On account of the foliated texture of oyster shell, it is not readily reduced to fine powder, hence chalk is occasionally substituted for the shell. Burnt bone has been used to adulterate prepared shell; in this case, the solution in hydrochloric acid sometimes leaves a dark (nearly black) residue when filtered, and the filtered solution precipitates copiously with caustic alkalies.

Precipitated Carbonate of Lime.—This should be a pure white impalpable powder, tasteless, inodorous and insoluble in water; soluble in hydrochloric acid with effervescence, the bubbles break-

ing readily and soon subsiding; solution transparent and colorless. Not well washed it may contain chlorides of sodium and calcium, or carbonate of soda and chloride of sodium. Washed with water, the filtered liquid, if chloride of calcium be present, will produce white precipitates with solution of nitrate of silver and oxalate of ammonia; carbonate of soda will be indicated when the above liquid turns the yellow of tumeric to brown. It may also contain iron and magnesia. In this case its solution in hydrochloric acid, rendered nearly neutral by an alkali, will indicate iron by producing a greenish or blue color with ferrocyanuret of potassium. Magnesia may be detected by adding to the solution in hydrochloric acid (an excess of acid being used) carbonate of ammonia, filtering and heating the clear liquid to the boiling point, to drive off any carbonic acid which may hold carbonate of lime in solution, filtering again if necessary, and adding phosphate of soda. A crystalline precipitate gradually forms if magnesia be present.

If prepared chalk or shell be substituted for, or mixed with, the precipitated carbonate, the permanency of the froth and the undissolved flocculi will be sufficient to discriminate this imposition. Sulphate of lime is also said to be used as an adulteration; in this case, there will be a residue left after the action of the acid in varying amounts, very slightly soluble in water.

Carbonate of Magnesia is in light, white, spongy masses, smooth to the touch, inodorous, tasteless, and insoluble. Thrown into dilute muriatic acid, it dissolves readily, with effervescence, forming a clear solution. At a red heat it loses about 58 per cent of its weight. The impurities present, may be soluble or insoluble in water. The former, the alkaline chlorides, sulphates, and carbonates, may be detected by boiling some of the carbonate in water and testing the filtered liquid with nitrate of silver, which will afford a white precipitate, if the chlorides, chloride of barium, a white precipitate if sulphate, and solution of turmeric, which will become brown if carbonate of an alkali are present. The insoluble impurities are alumina, lime and oxide of iron; its solution in hydrochloric acid yielding with ammonia added in such excess as to retain in solution all the magnesia; a gelatinous precipitate soluble in caustic potassa indicates alumina. The solution neutralized by ammonia, forms a white precipitate with oxalic

acid, and oxalates if it contains lime, and oxide of iron may be detected by nearly neutralizing the acid solution and adding ferrocyanuret of potassium, when a blue color will result.

Carbonate of Baryta.—The native carbonate of baryta, is official as a means of preparing chloride of barium. It is in yellowish fibrous masses, somewhat translucent; insoluble in water; soluble in muriatic acid with effervescence, leaving no residue. It may contain sulphate of baryta and carbonates of strontia and lime. The former will be left as a heavy insoluble residue after the action of muriatic acid; strontia will be detected by evaporating the solution in muriatic acid to dryness, and adding alcohol; on setting fire to the mixture, a red edge to the flame will be given, although the quantity of strontia present may be small. If lime be present, sulphuric acid in excess will precipitate all the baryta from the solution in muriatic acid, when the addition of solution of carbonate of soda will throw down a white precipitate of carbonate of lime, especially if the solution be raised to boiling point, to ensure the absence of an excess of carbonic acid. In the form of powder, it may contain sulphuret of lead, with which it is associated as a mineral; the muriatic acid will cause the evolution of the sulphuretted hydrogen, and sulphuretted hydrogen will produce a black precipitate when passed through the solution; solution of ammonia also produces a white precipitate not soluble in an excess.

Carbonate of Zinc.—Official under two forms, *Calamina* or impure native carbonate, and *zinci carbonas præcipitatus*.

Calamine, as intended in the Pharmacopœias, is that variety of the mineral which is composed chiefly of carbonate of zinc. It is when prepared in fine powder, varying in color from yellowish white to brownish yellow. In its purest form, it is totally soluble in diluted sulphuric acid with effervescence; generally it leaves an insoluble residue, derived from the adhering matrix. As for convenience of powdering, it is heated red hot, the effervescence is not great, on account much of the carbonic acid having been driven off. The solution produces a gelatinous precipitate with ammonia, nearly all soluble in an excess.

This article is commonly adulterated, or more properly spurious mixtures are substituted for it, to such an extent, that it is difficult to obtain a preparation under this name, containing any zinc. The factitious mixture generally contains sulphate of barytes, carbonate

of lime, alumina, oxide of iron, &c., and varies in color from yellowish brown to pinkish brown of different shades. Mr. Jacob Bell is of the opinion that spurious Calamine is not a factitious article, but is the mineral known to the English miners as *Baryta Calamine* in contradistinction to the true *Brass Calamine*, which is really amorphous sulphate of baryta colored with oxide of iron. (*U. S. Dispensary*, 9th edition, page 1279.) Acted on by dilute sulphuric acid it effervesces, and the cold solution after filtration, affords sometimes, only a brown flocculi of oxide of iron, at others, a gelatinous precipitate with ammonia, insoluble in an excess. Heated to boiling before filtration, the filtered solution in cooling deposits crystals of sulphate of lime. Dissolved in hydrochloric acid, the odor of sulphuretted hydrogen is sometimes evolved, and the residue is less in quantity than with sulphuric acid. From this solution carbonate of ammonia throws down a precipitate of a light brown hue, not redissolved by an excess.

Precipitated Carbonate of Zinc.—A very white powder soluble in acids with effervescence; its solution in diluted sulphuric acid acts as pure sulphate of zinc. Its accidental impurities are iron, copper and cadmium, derived from the sulphate, and may be detected as in the sulphate. It is adulterated with carbonate of lime. It is then but partly soluble in dilute sulphuric acid, and its solution in hydrochloric acid gives a precipitate with carbonate of ammonia not soluble in an excess.

L'OFFICINE (THE SHOP,) OU RÉPERTOIRE GÉNÉRAL DE PHARMACIE PRATIQUE, PAR DORVAULT, Paris 1850.

We have just received from the author a copy of the third edition of this valuable work, which embodies, in a single volume of 982 pages of two columns each, all the information wanted by the Pharmaceutist in his shop practice.

From a perusal of the work, we are induced, strongly, to recommend it to the attention of such of our colleagues as are acquainted with the French language. They will find in it, besides practical information of every sort, hitherto of difficult access, a general dispensatory and formulary, with polyglot synonyms, which

cannot fail being exceedingly useful. Such a work may be said to be a cyclopædia of Pharmacy and its accessory branches, which, in a single volume, will afford the condensed matter of a pharmaceutical library.

“L’officine,” in the words of Mr. Dorvault, “is not a scientific work; but one of more modest pretensions; it is a work of patience! Pharmacy as a science, had already been enriched by men of talents and reputation, with numerous treatises embracing, some, all the branches in a general point of view; others, limited to special subjects; but practical pharmacy, or in other words, the *pharmacy of the shop*, did not possess as yet a single work, in which could be found, collected together in a suitable form, all the various and numberless kinds of information that are indispensable in the shop practice.”

It is with a view to supply this deficiency, that Mr. Dorvault ably and industriously exerted himself in collecting together, so as to form a complete ensemble, all the useful matter that could be found disseminated in numerous special works, or were suggested by his own experience. How far he has succeeded in his undertaking may be inferred from the fact, that the first edition of the *Officine* was brought forth in 1844, and the third in 1850.

A work so obviously useful, and so extensive in its various subjects, could not attain its aim, unless all its parts were arranged in a methodical form, of easy and prompt access to the inquirer. This, the author has endeavored to realize, by dividing the work in different parts. The first, headed *Prolegomènes*, contains all the information particularly required for the proper understanding of the matters that are treated in the succeeding divisions. It contains 56 pages embracing the following subjects, viz.

Weights and Measures, or a full exposition of the French decimal system, with a good notice of European weights and measures, and a table of their respective value compared with the French decimals.

Hydrometers and Thermometers.—Their description, with rules for rendering the different scales; tables of specific gravity; tables of concordance of the three principal thermometers; tables of the points of fusion, ebullition and dilatation of the different bodies; and tables of frigorific mixtures.

Selection of simple drugs, in which is given the period most

appropriate for collecting plants or their parts, so as to gain, most effectually, their medicinal virtues; a tabular calender of the seasons at which they are collected; their desiccation, preservation, &c.

Succedaneous or analogous remedies, giving the analogy of the properties of plants of the same family, and, to a certain extent, a means of substituting one for the other, when necessary.

Scientific classification of plants and animals, treated in a tabular form.

Pharmaceutical classification and nomenclature.—Being an exposition of the several attempts that have been made by Beral, Chereau, and Henry and Guibourt, to form a scientific classification and nomenclature of remedies.

Therapeutic classification of remedies, useful both to the physician and the pharmacist.

L'art de formuler, or the philosophy of writing prescriptions therapeutically and pharmaceutically correct.

This chapter, and the following, entitled "*Execution of Prescriptions*," cover twenty-four pages, and are full of interesting details. They form, in themselves, a complete treatise on the particular branch of writing and executing prescriptions, worthy of an entire republication, if the limits of this journal permitted it; but we shall confine ourselves to a few quotations:

"The art of prescribing," says Mr. Dorvault, "is the application of the knowledge acquired in Chemistry, Pharmacy, Therapeutics, and in the physical and natural sciences. Therefore, in order to practice this art successfully, it requires a profound and diversified knowledge, united to qualifications almost innate, a perfect tact and sound judgment. Indeed, it may be asserted without any hesitation, that the art of prescribing is the criterion of medical ability, and the prescription is the end and object of medical studies, and the test of qualifications for practising medicine. A learned anatomist, a profound physiologist, one deeply versed in most medical sciences, in pathology itself, may be a scientific man; but he cannot be pronounced a Physician, if he be ignorant of the rules of this art."

This chapter, more particularly addressed to the practitioner, is intended to point out the best modes of associating drugs in extemporaneous recipes. The author treats of the subject under several

sections, viz : *Inscription*, or determination of the components; the relative quantities of these and the order of their arrangement in the prescription. It consequently involves Therapeutics, to fit the remedy to the disease, Chemistry, to avoid incompatibles, and Pharmacy, to determine the excipient and adjuvant best appropriated for the active base. *Subscription*, or the *modus faciendi* that is to govern the pharmacist in compounding it. *Instruction*, or directions to the patient or nurse relative to the administration of the medicine when completed.

Incompatibility is considered under three heads : Physical, Physiological and Chemical incompatibility.

All this chapter of the *Officine* might well form the subject of an interesting lecture in our medical schools. We highly recommend it to the particular attention of our young practitioners, who generally prove themselves more or less deficient in this branch of their science. We might, perhaps, without any impropriety, extend the advice to a few older physicians, whose unscientific prescriptions occasionally cause among us a good deal of perplexity, and excite the smiles even of our apprentices.

Execution of Prescriptions. The preceding article concerns, principally, the physician; this is wholly addressed to the pharmacist :

“ We have established as a principle,” says M. Dorvault, “ that a judiciously written prescription ought to exhibit the different substances therein specified, in the order in which they are to be mixed. Should the physician have neglected to do it, it is the duty of the pharmacist mentally to re-establish this order, when he executes the prescription. In ordinary cases, the execution of a formula, in itself, is a very simple process ; yet it is only by a long experience that the pharmacist becomes qualified to solve all the cases that may occur.”

“ Before proceeding to the execution of a formula, he will take care to read it with attention, and should he discover, or presume he discovers, any error which might endanger the health of the patient, he should take care, (for the sake of the physician who owes him a reciprocal regard,) not to show any embarrassment to the bearer of the prescription. Alleging as an excuse, that the medicine requires some time to prepare, he should request him to call in one or two hours, and should take advantage of this inter-

val to call on the practitioner and advise with him. Otherwise, unless the error be startling, and the physician not to to be found, he should put up the prescription without any alteration; or if any be made, he should not fail afterwards to inform the physician of what he has done." In this respect, Mr. D. adopts Mr. Vée's opinion in preference to that of Mr. Bouchardat, who maintains that in no case a pharmacist has a right to alter the prescription of a physician.

In order to save hesitation and anxiety to the pharmacist, and sometimes an unpleasant feeling between physician and pharmacist, Mr. Dorvault proposes that, every time a large dose of an active medicine is prescribed, it shall be stated, first in the ordinary figures of weights and measures, and then repeated in full writing on the margin or at the foot of the prescription.

"As it is granted that the practitioner calculates on the good quality of the medicine which he prescribes, his task is, as it were, accomplished the moment he has written his prescription. He, as well as the patient, rests in confidence on the ability and the uncontrolled honesty of the pharmacist. If the latter feels the importance and gravity of his office, he will know how to appreciate the obligation imposed on him by this implicit confidence, of which he should endeavor to render himself worthy by the most scrupulous attention and faithfulness in putting up the prescription. He should never, of his own accord, substitute one article for another, through neglect, or with a view to a sordid interest."

"The substitution of one medicine for another, may give rise to grievous consequences. It is calculated to deceive the practitioner as to the action of remedial agents, to confuse his former notion of *materia medica*, or induce him to suspect his own diagnosis."

"The curtailing of the dose of an article prescribed by the physician, having for its object an illicit profit, may be productive of still more calamitous consequences. Let us suppose, for instance, that an article prescribed in a rational dose, be curtailed by the faithlessness of the pharmacist, and thus fail to produce the desired effect; the physician, naturally ascribing the failure of his medicine to the insufficiency of the dose, will increase it successively, until he arrives at a toxical dose. Let us suppose then, that the same prescription be sent to another store

where it will be faithfully executed; it will follow that this latter prescription may prove a poison. We repeat it again, the pharmacist cannot, *proprio motu*, substitute one remedy for another, nor alter the dose prescribed by a physician, without incurring fearful consequences."

A table of abbreviations and symbols in pharmacy, terminates and completes the first part of the *Officine*.

The second part, headed *Pharmaceutical Dispensatory*, occupies 542 pages. It is an alphabetical description and arrangement of the simple substances used in medicine, and of the preparations derived from them, which is exceedingly comprehensible as to materials, but, sometimes, deficient in details, from the nature of the work, which does not admit of long descriptions. The history of a substance is always followed by the indication of its medical virtues, its dose and its incompatibles, whenever it is necessary. Salts are arranged under their acids, as acetates, carbonates, sulphates, &c., instead of their bases. Pharmaceutical compounds are placed in classes, as cerates, plasters, syrups, tinctures, &c., the several constituent drugs being inscribed under their respective heads. The information contained in this department of the work is exceedingly diversified. It is, at once, a treatise of materia medica, of practical pharmacy, and a general formulary. A few ill executed woodcuts are interspersed through these pages. The articles Extracts, Mineral waters, Leeches, Syrups, among others are pretty fully treated.

All the simple articles of any importance have the synonyms in several foreign languages, immediately under their scientific name, and a polyglot table at the back of the work affords a ready means for foreigners to consult the book.

The third part of the *Officine* is devoted to *Legal Pharmacy*. It contains, 1st, the laws, decrees, ordinances and police regulations relative to Pharmacy in France. 2d, A *treatise on Toxicology*, including a classification of the poisons; an indication of the symptoms produced by their introduction into the system; the means calculated to counteract their deleterious effects, and finally the reagents by which their character can be detected. 3d, It contains also a *pharmaceutical essay* by which the pharmacist may be enabled to test the purity of pharmaceutical products, and ascertain the falsification of the simple and compound medicines,

as well as the adulteration to which even alimentary substances are, occasionally, subjected to.

The two last divisions of this chapter are exceedingly valuable, and the matter condensed in them sufficiently comprehensible for all purposes. With the latter, the pharmacist will be enabled to ascertain the purity and genuineness of the drugs he purchases. With the other, he may, in a short time, place himself in a position to afford assistance in cases of poisoning, either by direct interference in the absence of a physician, or by assisting the practitioner in his difficult task.

Under the head of *Pharmaceutical appendix*, the following 72 pages embrace a variety of subjects, viz. ; *A formulary for veterinary practice* ; An essay on *Homœopathic pharmacy* ; Special points of information in *pharmaceutical chemistry* ; *A table of chemical compounds* exhibiting their symbols, equivalents, densities, and solubilities in water and alcohol, arranged in vertical columns, which will prove exceedingly useful and convenient. This table of chemical compounds is, probably, the most complete extant in any book, and is well calculated to facilitate chemical computation, and the preparation of the compounds obtained by double decomposition. There are also essays on *chemical analysis* and on *pathological chemistry* exceedingly desirable. Pharmacists have frequent occasions to make researches on some points of analytical chemistry, which they are sometimes at a loss to perform for want of a proper guide. They may, at any time, be called upon to ascertain the composition of an alloy, of a mineral, of an arable soil, of a mineral water, &c., or, they may have to perform, at the request of some physician, analyses of morbid secretions, of bile, urine, &c. In this chapter, they will find information calculated to assist them in the solution of these diverse problems of analytical chemistry.

Then follows a *miscellany* of 18 pages, including many valuable suggestions and recipes accessory to the shop business ; *Pharmaceutical economy*, or rules for governing the shop and laboratory ; a chapter giving catalogues of medicines, instruments and appliances suitable for ship and country medicine chests, for assistance to drowned and asphyxiated persons, and to the wounded on the field of battle, &c.; and lastly, a therapeutical reminder (*memorial therapeutique*) suggestive of the remedies used in dis-

eases, the names of the latter being arranged alphabetically, and followed by the reminder.

Following this appendix is a general tariff with blanks to be filled in with prices, analogous to our druggist's manual. An index of authors and the polyglot index before alluded to, conclude the *Officine* of Mr. Dorvault.

Such is the work which we have attempted to introduce to the notice of our colleagues, and which we recommend also to the attention of the medical profession. The industry of the author, in this undertaking, has been immense. He has thrown together an infinite amount of useful and well arranged matter, which will place the *Officine* among the most substantial works on practical pharmacy. As a whole, Mr. Dorvault's book may not have the same claims to a scientific treatise on practical pharmacy as that of Soubeiran; but such as it is, it will be found a most complete guide to carry on all the business of the shop, scientific and practical. It will, particularly, be useful in this country where the numerous foreign physicians, who have settled among us, are much in the habit of writing their prescriptions in their national nomenclature, or of prescribing preparations unknown to us either by name or composition.

We have, likewise, received another work of Mr. Dorvault, entitled *Iodognosie*, or a chemical, medical and pharmaceutical Monograph of Iodine and its compounds, published in 1850. This work of 300 pages has received two gold medals; one from the medical Society of Lyons in France; the other, from the Belgian Society of Sciences Belles Letters and Fine Arts. We have not had time as yet to examine the work thoroughly, but we have no doubt that this new production of Mr. Dorvault, so successfully crowned by two learned Societies, is deserving the attention of Physicians and Pharmacutists.

E. D.

"ECLECTIC PHARMACY."

BY EDWARD PARRISH.

Most of the readers of the Journal, especially those residing west of the Alleghenies, are aware that among the productions of the Nineteenth Century, is a certain class of medical philosophers yecept "Eclectic" or "Reformed" practitioners. The head-quarters of this sect appears to be in Cincinnati, where they have their principal school, and where also is published the "Eclectic Medical Journal," a monthly periodical of considerable pretensions, edited by Dr. Joseph R. Buchanan and Dr. T. V. Morrow, both professors, and Dr. David Shepard, "Corresponding Homœopathic Editor."

In the said Journal,* is an article entitled Eclectic Pharmacy, by W. S. Merrill, A. M. My attention was directed to this some months since, by a gentleman who desired me to prepare for him some concentrated preparations spoken of therein.

The author of the essay referred to, claims to be the discoverer of certain active resinoid principles, to a description of which, their mode of preparation, &c., the article is devoted.

They are obtained from the roots of *Podophyllum peltatum*, *Cimicifuga racemosa*, *Sanguinaria canadensis*, *Leptandra virginica*, *Iris versicolor*, and certain other roots, which are little used by regular practitioners.

This author proposes to call these principles by the generic name of the plant from which they are derived, with the termination *in*, resembling that of Resin, as in the case of the alkaloids the termination *ia* is adopted, resembling that of the alkalis proper.

This arrangement proposed by the writer as though original with himself, is in fact that adopted long since in standard works, and if followed by all writers and experimenters would be productive of great advantage. Upon this plan Jalapin, Piperin, Santonin, and many similar principles, are named, but in each case the name is applied to the resin in a state of purity.

The claim set up by this "Eclectic Pharmaceutist," that he is the discoverer of these resinoid principles, is the most curious feature

*Vol. II. No. 7, July 1850.

of the article in question. That our readers may see his argument as presented by himself, the following remarkable passages are quoted.

"It is often asked with respect to Podophyllin, Leptandrin, and other analogous preparations, am I the discoverer of these? I answer, I am so in the same sense that Fulton invented the steamboat, and Morse the electric telegraph. The power of steam and its application to machinery, was known before the time of Fulton, and it had even been applied to the propelling of a boat; but he carried these inventions *one step further*, and *first* made them of practical utility in navigation.

The properties of electro-magnetism, and even its power to produce mechanical motion, was known before the inventions of Morse. He only advanced a step on these discoveries and made them subservient to the important uses they now perform.

So of these medicines. Other pharmacutists had partially examined the Podophyllum, the Macrotys, and several other of our indigenous medical plants, and had discovered that among other proximate principles, they contained one of a resinous character, and Mr. Lewis, of the Philadelphia College of Pharmacy, (whose analysis was probably previous to mine, although not published till afterwards,) announced that the resin of Podophyllum was a drastic cathartic in doses of six or eight grains. But these discoveries lay as dead facts in the records of science until, without a knowledge of any of them, I obtained these principles in a purer form, and by a more eligible process, and immediately tested their operation, and with the efficient co-operation of the professors, and other physicians of the Eclectic school by whom I am surrounded, established their character as among the most important agents of the *materia medica*."

After thus attempting to sustain the extraordinary claim he had set up to originality, the author proceeds to describe the method he adopts to obtain these resinoids.

"The process for procuring these is, in theory, very simple. It is in general to obtain a saturated alcoholic tincture of the root. To this add a large quantity of water, and distil off the alcohol. The watery menstruum holds in solution the gum, mucilage, extractive and most of the coloring matter, while the resinoid substance subsides, and is collected, washed and dried. Still the process requires in many points no little skill and pharmaceutical experience for its success.

The yield of these resinoids, from different roots, varies considerably, as might be expected, but the average of these principles is from two to four per cent., or from a half oz. to one oz. from the pound of powdered root.

In the manufacture of these medicines the price of the root is but a moiety of the actual cost. The grinding, the waste of alcohol, even with the most

perfect apparatus, and the labor and time employed, constitute the larger portion of the expense of production, so that the physician or even the druggist will seldom find it good economy to prepare for themselves."

From what has been quoted it will appear that this article is, in fact, an advertisement of the preparations of the said W. S. Merrill, A. M., designed to introduce them to the notice of Physicians and the trade, as his own, and intimating that they are prepared by a difficult process not conveniently resorted to by pharmacutists generally. It is evidently intended, rather to discourage any attempts to prepare them, than to invite the co-operation of pharmacutists by a candid and full detail of the process and its results.

This view is strengthened by a remark occurring somewhat farther on in the article, as follows :

"The cost of obtaining the pure resinoid principles from our different indigenous plants, varies considerably, according to the price of the material and the amount of yield, but for the sake of convenience we have fixed on one dollar per ounce, as the uniform price of them all, at present, with the usual commercial discount to those who buy in quantity to re-sell."

Now whatever may be our views of the propriety of this mode of advertising, as practised in a professedly scientific Journal, under the guise of contributing to the common stock of professional knowledge, it must be admitted that in this case it has been scarcely less successful than the more open quackery of certain other manufacturers of medicinal preparations.

These so-called resinoids have attained a very considerable sale, and from being used almost exclusively in the West, where they originated, have been introduced into our market and into those of New York and Boston.

I have thought the results of some experiments in preparing them worthy of a place in the Journal, for the information of any who may have calls for them, and would suggest that the names by which these pharmaceutical preparations are designated, should not be confounded with those applied to the pure resinoid principles they contain. As well might the Calasaya Extract of Ellis be called *quinia*, as the impure resinoid substance precipitated from a tincture of May-apple, by the above process, *podophyllin*.

The same remark applies to other resinous roots, and in the event of the adoption of a class of resinous extracts into Phar-

macy, such as form the subject of this essay, the question will arise and must be met, what name shall be given them?

Experiments upon May-apple Root.—On treating 2 pounds of this root in powder, with alcohol, sp. gr. .835, in the steam displacement apparatus of C. F. Smith, I obtained about half a gallon of a concentrated tincture; this was divided into two portions of two pints each.

Of these, the first was mixed with about four pints of water, and evaporated till the alcohol was all driven off. The aqueous liquid being now decanted, left a quantity of a light brown colored powder adhering to the dish, which being collected, washed and dried, weighed 219 grs., and very nearly corresponded in appearance with the *Podophyllin* of Merrill. The other portion of the tincture, consisting of two pints, was evaporated nearly to dryness, leaving one and three quarter ounces (av.) of alcoholic extract, too tenacious and deliquescent to powder.

500 grains of this extract were treated freely with boiling water, and the water being poured off, the resinoid substance was collected in the form of a shining mass of a dark brown color, the undissolved portion not adhering to this being also collected on a filter the whole weighed 138 grs. As thus prepared, it had a darker brown color than the first mentioned product, but in other respects resembled it.

It will be perceived from this, that the yield from May-apple Root treated with alcohol was as follows: By the evaporation of the tincture, one and three quarter ounces, av., (766 grs.;) from the troy pound, (5760 grs.) about *thirteen per cent*, by precipitating the resin with water, 219 grs. from the same quantity, *three and three quarters per cent*. Corresponding precisely with the results of the experiment with the extract, 500 grs of which yielded 138 grs. of the resin. With a view to testing the expediency of depriving the root of all its principles soluble in water, previous to treating it for the resin, I boiled a portion of it in water, and submitted the pulpy mass to pressure to deprive it of the aqueous liquid; it was then allowed to remain, with a view to drying off; but owing to the pulpy nature of the magma, I could not conveniently dry it before it threatened decomposition, and was obliged to treat it with alcohol while yet moist. By this means, an extract was obtained which weighed nearly 50 per

cent more than the previous extract made with strong alcohol, and which, on being treated with water, yielded a comparatively small proportion of the precipitated resin.

As obtained by the process first detailed, the precipitated resin of *Podophyllum* is of sufficient purity for convenient medical use, being nearly four times the strength of the extract prepared with strong alcohol, and much stronger as compared with the hydro alcoholic extract officinal in the *Pharmacopœia*.

The "Eclectics" recommend it as "a powerful cholagogue cathartic, substituting, and for all useful purposes more than substituting, the long celebrated 'Sub Murias Hydrargyri' of the old school,"—a recommendation which most regular physicians will accept with several grains of allowance. It is given in doses of from half to two or three grains, triturated with sugar or with some mild cathartic. It has a more or less light brown color, with a very strong characteristic odor and taste, is freely soluble in alcohol, is separated by ether into two resins, one soluble (largest in quantity,) and the other insoluble in that liquid. It is nearly insoluble in oil of turpentine. With carbonate of potassa it furnishes a solution, which on the addition of an acid throws down the resin. The alcoholic and ethereal solutions treated with animal charcoal and evaporated, furnished the resin of a lighter color, though not pure.

One advantage offered by this preparation which may not at first occur to the reader, is the absence of that tenacious character which belongs to the Hydro-Alcoholic Extract of *Podophyllum*, and renders, it like the similar extract of *Jalap*, exceedingly troublesome to make into pills, or to combine in any other form for use; it is, moreover, when properly prepared, of uniform strength, neither absorbing nor parting with moisture on exposure.

On reference to the thesis of the late John R. Lewis, published in this Journal, (vol. xiii, new series, page 165,) I find that the chemical characters of May-apple root were thoroughly investigated by him, and the active principle podophyllin was isolated in the different forms of opaque feathery scales, a light colorless powder, a translucent gelatinized mass (believed to be a hydrate), and in globules like dried gelatin. He also bears testimony to its activity as a drastic cathartic, in what would appear to be the very excessive dose of six grains.

My object in the foregoing remarks has not been to add to the facts already known upon the chemical history of May-apple, so much as to introduce to the profession, a pharmaceutical preparation and process for preparing it, which I think offers some advantages over the extract in common use, and is at least worthy of a trial at the hands of scientific physicians, in order that its real merits may appear.

Experiment upon Black Snake Root.—Following the process spoken of in the essay quoted above, I submitted two pounds of black snake root or cohosh, to the action of alcohol by the displacement process. A large quantity of alcohol was necessary to exhaust it in this way, which was partially recovered by the use of a tin retort, and Liebig's condenser; after obtaining the tincture in a concentrated form, measuring about twelve fluid ounces, it was mixed with twice its bulk of water and the alcohol evaporated off. The resinous deposit being collected, was a shining mass of a dull garnet color, translucent along the edges. It possessed a faint odor with the peculiar taste of the root in a high degree; when powdered, it resembled in color the resin obtained from podophyllum. This is the preparation called by Merrill, *Macrotin*, from the name given to *Cimicifuga* in Eaton's Manual, "*Macrotys Racemosa*."

The proportion obtained from two pounds of the root was about one and a half ounces, (av.), and the residue upon evaporation after the precipitation of the resin from the tincture, weighed two and three quarters ounces, (av.), so that the root yielded *four and three quarters per cent.* of the precipitated resin, and would have yielded *thirteen and a quarter per cent.* of alcoholic extract. The dose is stated, by Merrill, at from one to six grains in the course of the day, given in pills. The reputation this root has attained, especially in the treatment of chorea, leaves little room to doubt that such a preparation would be a useful addition to the material of our practitioners.

The resin obtained in this way from *Leptandra virginica* or Black root, is I believe a discovery or invention of the author I have quoted; very little is known of the medical properties of this root among regular practitioners, but if his account be credited "its medicinal action is that of cholagogue, and hepatic, with but feeble cathartic powers, and acting in small doses as a tonic on the primæ viæ; it hence fills a previously existing blank

in the *Materia Medica*." "*Leptandrin*" is represented as a jet black substance resembling asphaltum.

Sanguinaria canadensis yields to treatment such as described, a bright red substance, of a resinous character, said to contain both its resinoid and alkaloid principles; but of this, considering the relations and habitudes of the latter, there would seem to be some doubt. The so called Sanguinarin of Merrill, however, is said to have met with some favor, as combining the stimulating and narcotic powers of the root in a concentrated form. My experiments upon it have not been sufficiently matured up to the time of going to press to lead to a satisfactory account of its chemical characters.

Of the numerous other preparations spoken of in the article from which I have quoted, some are purely empirical, others are prepared from vegetable simples, with the medicinal value of which, (if they possess any), the regular profession is but little acquainted, and others are well known to pharmacutists generally, and are found in the shops of regular as well as of the self styled "Eclectic Pharmacutists."

ON THE PREPARATION OF VOLATILE OIL OF ROSES IN THE EAST.

BY DR. X. LANDERER,

Hon. Member of the Pharmaceutical Society of Great Britain, Professor in the University of Athens, Pharmacien to the King of Greece, &c.

Pharmacologists distinguish two varieties of essential oil of roses, namely, the Indian (*Oleum rosarum Indicum*), and that from the Levant (*Oleum rosarum Levanticum*.)

These volatile oils are obtained from various species of rose, but principally from *Rosa sempervirens*, *R. moschata* and *R. centifolia*.

The methods by which the oil is extracted are various. In India the fresh petals are allowed to macerate in water in vessels exposed to the sun, and the oil which is found floating on the surface, is removed by decantation. Distillation with water is sometimes resorted to, the volatile oil being separated in a congealed state after exposure to the well saturated rose water in a

cold place for several nights. The process adopted in China is somewhat different. The seeds of a species of *Digitalis* called *Sisama* are placed on layers of fresh roses, and after a contact of some days, both are submitted to strong pressure; from a fatty oil thus obtained, the volatile oil of roses is separated by distillation.

To the foregoing descriptions, I am desirous of adding that of another not so generally known, for the account of which I am indebted to a person who was engaged for several years in the manufacture of essential oil of roses at Damascus, and in some other parts of Asia Minor. It is a fact there well known, that oil of roses prepared by ordinary distillation, separates itself from the rose water in the form of a stearoptene. In order to obtain it liquid, transparent, dry and bright, as seen in commerce, it becomes needful to submit fresh roses to dry distillation. The following is the process:—The rose-buds collected before sun-rise and deprived of the calyx and other green portions, are packed while yet fresh in a glass retort of the same description as those made at Cairo. The retort is placed in a salt water bath, and a dry distillation is carried on, during which process the heat is cautiously increased, care being always taken that the contents of the retort do not become scorched. In order to diminish the loss of heat, the retort is surrounded by coarse cloths. The product of this distillation consists of a watery liquid of a deep brown color, upon which floats the oil of roses. The separation of the latter is effected in the usual way; the aqueous portion is also reserved, being highly esteemed in the East as a perfume. When separated, the oil is mixed with salt water, by which it acquires a paler color; packed in small vials it is carried to Constantinople, under the name of *Güll Jaghi*, or oil of roses.

[In English commerce the wholesale dealers distinguish no other variety of oil of roses than the Levantine, which is imported from Turkey and sold as Turkish Otto of Roses.]—*London Pharm. Journ.*, Sept. 1851.

ON THE MANUFACTURE OF CREAM OF TARTAR, TARTARIC ACID, PARATARTARIC ACID, CARBONATE OF SODA, SULPHATE OF POTASH, ROCHELLE SALT, AND CITRIC ACID.

Manufacture of Cream of Tartar.—One of the constituents of the juice of the grape is the bitartrate of potash, which, in the form of what is called in commerce *tartar* and *argol*, is deposited in the wine casks on the commencement of fermentation, and this salt being but slightly soluble in dilute alcohol, the quantity deposited increases in proportion as the fermentation, and consequent increase of spirit in the liquid, progresses. Another portion of the tartar or argol is obtained from the marc or mass of grape stalks and husks remaining after the juice has been pressed out: and a further portion is found in the froth or scum which rises to the surface of the fermented liquors. From one or all of these sources combined, the cream and tartar of commerce is obtained. For this purpose the tartar deposit or scum is placed in a copper full of water, and boiled for an hour or so, to dissolve out the bitartrate of potash. This solution is then filtered off into large coolers, where colored crystals of tartar are obtained, free from many of the impurities previously contained in it. These colored crystals of tartar are then returned to the copper, and dissolved by boiling in water; a quantity of animal charcoal is next added for the purpose of decolorizing the solution, and shortly afterwards some white clay for the purpose of finishing the discoloration and removing the animal charcoal employed. The colorless solution is filtered off into crystallizing vessels as before, and thus colorless crystals of cream of tartar are obtained. If the crystals be not sufficiently white, the second part of the process may be repeated. As, however, it often happens that these tartar deposits contain a good deal of tartrate of lime, the manufacturers at Montpellier have of late introduced some improvements in the making of cream of tartar, with the view of transforming this tartrate of lime, which would otherwise be lost, into bitartrate of potash. To effect this, the matters containing tartrate of lime are boiled with sulphate of potash and an excess of sulphuric acid, by which means sulphate of lime and bitartrate of potash are obtained. Another improvement lately adopted, consists in converting the neutral tartrate of potash,

which is found in the mother-liquors, resulting from the first operation in the manufacture of cream of tartar, into bitartrate, especially when the matters operated on have undergone a commencement of fermentation. As, instead of water, these mother-liquors are employed in the solutions of fresh portions of the raw materials, they at length become charged with neutral tartrate of potash. To convert this neutral tartrate into bitartrate of potash, sulphuric acid is added until no further precipitation of bitartrate takes place: the mother-liquor contains, together with some bitartrate in solution, sulphate of potash, which serves in the before-mentioned process for converting tartrate of lime into bitartrate of potash.

Manufacture of Tartaric Acid.—The process indicated by the London Pharmacopœia is not now adopted on the large scale; the following is the process commercially employed. A large wooden vat or generator, as it is termed, closed at the top, and furnished with a man-hole secured by a water joint, is the apparatus or vessel used for the decomposition of the tartar and liberation of the tartaric acid. This generator is provided with an exit-pipe for the escape of the carbonic acid gas, liberated during the process, and an agitator or stirrer, consisting of a stout iron rod having attached to its lower extremity a long arm of wood to stir the contents of the generator, the upper extremity of the rod being connected by means of appropriate machinery with some motive power, as that of a steam engine. The generator is usually of a capacity of about 2000 gallons, and is larger at its base than at its summit. A pipe, in connection with a steam-boiler, enters at the side of the generator, and another pipe connected with a reservoir of cold water, enters the upper part of the generator, which is also provided with cocks at suitable levels for the purpose of drawing off the contents. Into this generator, about one-fourth filled with water, 1500 pounds more or less (according to the quality of the tartar employed,) of whiting or washed chalk (carbonate of lime,) are introduced, steam is then allowed to blow in from the boiler so as to heat the water, and the agitator is set in motion until the lumps of the whiting are broken and a mass of uniform consistence obtained; this done, about two tons of tartar of average quality are introduced by degrees, and the agitator again set

in motion ; the result is, that the free tartaric acid contained in the bitartrate of potash unites with the base of the whiting, forming insoluble tartrate of lime, which precipitates to the bottom of the generator, leaving the neutral tartrate of potash in solution, the carbonic acid having escaped through the exit-pipe in the gaseous form.

Having thus removed one equivalent of tartaric acid from its combination with potash, the next part of the process is to remove the other ; and this is effected by the addition of sulphate of lime in the state of paste, to the solution of tartrate of potash ; heat and agitation are again applied, the tartrate of potash is decomposed, the second equivalent of tartaric acid enters into combination with the base of the sulphate of lime, and tartrate of lime precipitates to the bottom to join that formed in the previous operation, whilst the potash united with sulphuric acid remains in solution as sulphate of potash. The solution of sulphate of potash thus formed, is drawn off when clear, into suitable reservoirs to be treated, as hereinafter described. The tartrate of lime is next well washed with two or more successive charges of cold water ; these washings contain more or less of sulphate of potash, and are run off into suitable reservoirs. To the remaining tartrate of lime a sufficient quantity of water is then added, together with the requisite quantity of sulphuric acid, to effect its decomposition ; sulphate of lime is precipitated, and tartaric acid remains in solution. The whole contents of the generator are now run off into a wooden back lined with lead, some fifteen or sixteen feet in length, six in width, and two in depth, furnished with a perforated false bottom, and lined throughout with stout twilled flannel. This back serves as a filter, and the filtered solution of tartaric acid passes off through a pipe, connected with the bottom of the back, into suitable reservoirs. When the acid solution has passed through the filter, water is carefully added to the sulphate of lime remaining, in such a way as to insure its uniform percolation through the mass, and not to run off through partial channels or fissures formed in the sulphate, which would prevent the entire removal of the acid. As soon as the residuary sulphate of lime is quite tasteless, and the filtered liquor free from tartaric acid, the pasty mass of sulphate of lime is removed by means of wooden shovels, and as much of it as may be required is again used in the

decomposition of the neutral tartrate of potash solution of the succeeding operation; whilst that portion of it which is not required for that purpose, may be dried over the coke ovens herein-after mentioned, and sold as manure. The expense of chloride of calcium, formerly employed to effect the decomposition of the tartrate of potash, is thus saved, and the decomposition quite as effectually accomplished. The filtered solution of tartaric acid is next concentrated by evaporation, and crystallized; for this purpose it is placed in wooden vessels lined with lead, of various lengths and widths, and about nine inches deep, along which coils of lead-pipe are made to traverse; steam is then passed through these pipes, and the concentration of the acid is thus effected. Deposits of sulphate of lime, held in solution by the acid, take place around the lead pipes during the process of concentration. As the solution of tartaric acid is readily decomposed, care should be taken that the temperature does not much exceed 165° Fahr. There can be no doubt that the adoption of the vacuum-pan would prove highly advantageous in the concentration of tartaric acid solutions. The plan of pumping cold air into the tartaric acid solution whilst undergoing concentration, has been tried on a large scale, but experience having proved that a loss of acid resulted, the process has been abandoned.

When the liquor has attained the specific gravity of about 1500° it is drawn off into suitable crystallizing vessels; these are formed of sheet-lead, are cylindrical in shape, usually about four feet in height, and two feet in diameter, and each capable of holding about five cwt. of tartaric acid in solution; these crystallizers are placed in a warm situation, and in the course of three or four days there is produced in each a crop of crystals averaging about two cwt. These crystals, however, contain a portion of coloring matter, which is removed by placing them in a vessel lined with lead, with water and animal charcoal (previously well washed with dilute hydrochloric acid to remove the calcareous salts contained in it,) steam is blown in, the acid is dissolved, and the saturated solution digested with the animal charcoal, filtered, again concentrated, and crystallized. The crystals are next washed, drained, and lastly, dried on wooden trays lined with thin sheet-lead, placed in a room heated by steam.

By these means, a colorless acid of great purity is obtained, which is then packed in casks for sale. The mother-liquors of the first crystallization are again concentrated, and the crystals obtained, digested as before described with animal charcoal, until at last, by the accumulation of vegetable and other foreign matters, the liquors are no longer crystallizable; they are then decomposed by means of chalk, and the tartrate of lime thus obtained added to the produce of a new operation. It is found in practice that a slight excess of sulphuric acid is necessary in order to obtain fine crystals of tartaric acid; care, however, must be taken to guard against the accumulation of sulphuric acid in the process of manufacture, to the risk of destroying the tartaric acid.

With respect to the drying of this acid, there can be no doubt that the centrifugal method of drying would be far superior to the present mode, as the crystals often adhere to the lead-lining of the drying trays, and having to be forcibly detached, their shape and the general appearance of the acid becomes much impaired; whereas, by the centrifugal mode of drying, the crystals may be obtained of a more perfect and regular shape, and the general appearance of the acid greatly improved.

The principal consumers of tartaric acid are the calico-printers, who use it for the purpose of evolving chlorine from solution of chloride of lime, in the production of white, or what is technically termed discharged patterns upon a colored ground. Its pharmaceutical uses are too well known to require comment. The *average* annual quantity manufactured in Great Britain may be taken at about 1,000 tons, of which a certain quantity is exported to the continent of Europe and to the United States.

Paratartaric Acid.—There is occasionally to be met with in the market, a tartar obtained from the grapes grown in the department of Vosges, which contains a large proportion of paratartaric or racemic acid. This acid may be distinguished from tartaric acid by its silky, needle-shaped crystals, and its insolubility compared with tartaric acid, 100 parts of water at 60° dissolving only 14.1 racemic acid, whilst 100 parts of water at 60° dissolves 64.8 of tartaric acid. In the second volume of the Records of General Science, will be found a series of papers on this acid and its

combinations, by Dr. Thomas Thomson. A striking difference between tartaric and racemic acids is exhibited, when we drop solutions of these acids into solutions of chloride of calcium. The former occasions no precipitate, while the latter throws down a copious deposit. Thus we see that racemic is a more powerful acid than tartaric. Accordingly, it is capable of decomposing various tartrates and taking the place of their acid. M. Kestner, a manufacturer of tartaric acid at Thann, a small town in the department of the Vosges, first noticed the existence of this acid about the year 1817. A few months since he called the attention of M. Pelouse to the circumstance, that of late years he had not met with this acid in the ordinary course of manufacturing tartaric acid. It would appear from M. Kestner's letter to M. Pelouse, and which was read at one of the sittings of the Paris Academy of Sciences, that in the years 1822 to 1824, he was in the habit of decomposing the crude tartars he employed, by carbonate of lime, using a large excess of sulphuric acid in the decomposition of the tartrate of lime, and passing a current of chlorine gas through the tartaric acid solution for the purpose of removing its color; but that since 1824, he has been accustomed to decompose the tartar by caustic lime, using a slight excess only of sulphuric acid in the decomposition of the tartrate of lime, and omitting the bleaching process. During the period he employed the first named process, he frequently detected the presence of paratartaric acid, especially in winter; but from the time of his discontinuing that process up to the present time, he has failed in obtaining the slightest indication of it. He furnishes no analysis of the tartars employed at those respective periods, and confesses himself quite at a loss to account for these phenomena. He concludes by expressing the hope, that the future researches of scientific men may throw some light upon the obscurity in which this subject is at present involved.

Recent investigations have led to the conclusion that most tartars contain a certain portion of paratartaric acid, which is lost in the process at present employed in the manufacture of tartaric acid. This fact may serve to account for the deficient results sometimes obtained.

Manufacture of Sulphate of Potash.—The solution of sulphate of potash, resulting from the decomposition of the neutral tartrate of potash by sulphate of lime, as above mentioned, is run into sheet-iron boilers placed over a coke oven, in which it is concentrated to a certain extent, and is then drawn off into suitable vessels of iron, or wood lined with lead, in which the evaporation is completed by means of steam from the boiler in which the weaker liquors are evaporated, the steam thus generated being made to traverse coils of lead or iron pipe placed in the solution. The sulphate of potash crystallizes as soon as the liquor has acquired a certain density, and falling to the bottom of the vessel, or becoming attached to its sides, is readily fished out by means of strainers; and its superfluous moisture having been allowed to drain out, it is packed in a somewhat damp state in casks ready for sale. In this process the spare heat of the coke oven is made available, and as the complete evaporation of the solution is accomplished by the agency of the steam from the boiler, the greatest possibly economy is thus effected as regards fuel. This process is, of course, applicable to a variety of other purposes where large quantities of weak liquors have to be evaporated, and where a market can be obtained for the coke manufactured. The principal consumers of this impure sulphate of potash are the manufacturers of prussiate of potash: it has also been applicable as manure.

Pure sulphate of potash may be obtained by dissolving the impure salt, digesting it with animal charcoal, filtering and recrystallizing.

Bisulphate of potash may also be obtained by heating the impure salt with the requisite excess of sulphuric acid, and proceeding as above.

Mr. A. J. Phillips read a paper a few days since at the Chemical Society on a double salt of sulphate of potash and lime, discovered by him to exist in the deposit from the sulphate of potash in liquors in the boilers before mentioned. As this paper will no doubt appear in the Quarterly Journal of the proceedings of the Chemical Society, we will confine ourselves to simply mentioning the constitution of this double salt as furnished by two analyses of Mr. Phillips:

	No. 1.	No. 2.
Potash . . .	28.52	28.57
Lime . . .	16.99	16.96
Sulphuric acid .	48.94	48.55
Water . . .	5.51	5.67
	<hr/>	<hr/>
	99.96	99.75

The purchasers of crude sulphate of potash will be much obliged to Mr. Phillips for this communication.

Manufacture of Bicarbonate of Soda.—In our notice of the process employed in the manufacture of tartaric acid, we mentioned that whiting or carbonate of lime was employed for the purpose of taking up the free acid in the bitartrate of potash, this action being attended with a copious evolution of carbonic acid gas; the carbonic acid so liberated, is employed in the manufacture of bicarbonate of soda. For this purpose, a series of two or more square air-tight wooden vessels, lined with lead, and fitted with a perforated false bottom placed about one foot from the lowest part of the vessel, are filled with crystals of carbonate of soda (the common commercial soda,) and connection established between them by means of leaden pipes. Into the first vessel of the series, the carbonic acid gas, previously passed through water, is introduced, and after a few days the crystals of soda will be found to be converted into bicarbonate, which is then removed, dried, and having been ground to the requisite degree of fineness, packed in casks for sale. Ten cwt. of crystals of soda yield upwards of five cwt. of bicarbonate. The water of crystallization contained in the crystals of the bicarbonate, passes through the perforated division with the lower compartment of the vessel, whence it is drawn off by means of a cock placed for that purpose, and as it contains a certain portion of soda, it is used in the manufacture of Rochelle salt, which we shall presently describe, or for any other purpose requiring a solution of soda.

It will be obvious, that carbonic acid gas from any other source will do equally as well for the manufacturer of bicarbonate of soda as that obtained as above described.

Manufacture of Rochelle Salt.—This double tartrate of soda and potash is prepared in the same apparatus as that described in the manufacture of tartaric acid. A solution of crystals of soda is first made, and to it is gradually added the bitartrate of potash in the form of crude tartar, the free tartaric acid in the bitartrate combines with the soda, carbonic acid is evolved, and the resulting solution is composed of one equivalent of neutral tartrate of soda and one of neutral tartrate of potash. This solution is drawn off, concentrated by evaporation, crystallized, the crystals re-dissolved and digested with animal charcoal, the solution filtered and re-crystallized; the product obtained consists of colorless crystals of Rochelle salt.

Manufacture of Citric Acid.—In the manufacture of citric acid the same apparatus is employed as we have described under tartaric acid. Into the generator any given quantity of concentrated lime or lemon-juice, as imported from Sicily, is placed, and to it is added as much whiting as will suffice to neutralize the citric acid it contains; carbonic acid gas is evolved, which may be applied to the manufacture of bicarbonate soda and carbonate of lime, as above mentioned, and citrate of lime is precipitated to the bottom of the generator. The supernatant liquor containing much of the extractive matter of the lime-juice is run off, and as much dilute sulphuric acid added to the sulphate of lime as will serve to liberate the citric acid it contains, whilst the sulphate of lime formed is precipitated. The mixture of citric acid and sulphate of lime is then run off to a filter back, arranged in the same way as that described in treating tartaric acid, and the operations of washing the residuary sulphate on the filter, concentrating the juice by evaporation, and subsequent crystallization and purification, are all precisely similar to those described under tartaric acid. As citric acid is even more liable to decomposition than tartaric acid, still greater care must be taken in its concentration and subsequent treatment. Evaporation in vacuo is particularly desirable in the case of citric acid, and the centrifugal process of drying might also be employed with great advantage.—*Pharmaceutical Journal and Transactions*, February, 1851.

ON THE MEDICINAL PROPERTIES OF THE GUACO.

By P. L. SIMMONDS, Esq.

At a time when cholera has been committing great ravages throughout our West India Colonies, I beg to bring under the more general notice of the profession a remedy which has been effectually tried and found useful in several quarters. The "Bi-juco de Guaco," the *Mikania Guaco*, a creeping plant, native of South America, but now naturalized among the Antilles, has long been held in repute as an antidote to the bite of snakes; its medical properties, have not, however, hitherto been fully described. There are several species of Eupatorium closely allied to this guaco, and many varieties of the Milkania, so that among fifty or sixty of them it is difficult to identify the true medicinal guaco, or that which is here specifically recommended.

The leaves of the best sort are stated to be heart-shaped, from four to six inches long, by two or three broad, the edges slightly curved and a little notched, of a fine dark green on one side and of a light purple changing color on the other. The leaves and stem are pubescent, and have a very bitter pungent taste. There are two principal kinds, distinguished by the flowers, those of the one being pale yellow, and the other white. The former is preferred.

Some years ago Mr. Henry Vendryes delivered a lecture before the Jamaica Physical Society on the virtues of the plant. It was first introduced into use for its medical properties by Don Andres Diaz, of Havana; and Dr. Chabert, of that city, described its curative properties in cases of cholera, in the *Diario de la Habana*. In a pamphlet published by Don Andres Diaz he says—

"The preventive virtue of the guaco against all poisons is undeniable. My own estate having been visited by that awful scourge (the cholera), on the sixth day I found that twenty-eight of my people had died, and that twenty-two were in the hospital, all in the last stage of cholera. Seeing that, notwithstanding the treatment recommended by our medical faculty, our people were dying almost as soon as they were attacked by the malady, it struck me that by adopting the proposed remedy I might have a

chance of saving many of my fellow-creatures. I determined on trying it ; I picked out three of the worst cases, and from the first dose which I gave them I began to observe its efficacy in producing the necessary reaction. At the same time that I gave the guaco to the sick, I caused the healthy also to take it, so that the malady soon ceased."

The author then gives a few statistical returns, which prove authentically that out of 400 persons who were attacked with cholera, on four plantations surrounding his own, and on which the guaco was used at his recommendation, only twenty-five died, and several of these from the remedy having been applied too late.

Three modes of administering it have been recommended :—

First, Combined with sulphuric acid, prepared in the following manner :—To one ounce of the boiled mucilage add four ounces of sulphuric ether, put into a well-corked bottle. Infuse for three or four hours and it will be fit for use. The mucilage is prepared by triturating in a mortar two ounces each of the stem and leaves of the plant, and boiling for one hour in a pint of water, straining the residue through a cloth, and expressing well the juice with the fingers. The mucilage is to be used cold when combined with the sulphuric ether.

Secondly, as a *ptisan*, prepared the same way as common tea, by infusing 1 oz. of the leaves and stem in a pint of boiling water ; or by boiling the same quantities, if a strong decoction be required. The leaves and stem should be triturated before boiling or infusion.

Thirdly, as an elixir, prepared in the following manner :—Into four gallons of strong proof rum (17° if possible), put three pounds of stems and leaves of the plant, well triturated in a mortar, and after twenty four hours infusion, it will be fit for use. When the quantity has been reduced one-half, an equal proportion of spirits may be added. It must be used as strong as possible, or it is not to be depended upon for use internally, but may answer for baths. In case of the best sorts being obtained, it may be substituted for the sulphate of quinine, when the latter cannot be procured, and successfully in many other cases, I have no doubt, as a powerful tonic. Indeed the valuable properties it possesses, like those of the Cedron, are comparatively little known.

The genus *Mikania* was established by Willdenow, and the

celebrated Mutis, of Santa-Fe, first made known its medical properties as an antidote against the bite of certain serpents. Humboldt and M. Bonplandt have confirmed the powerful virtues of the plant.

The whole plant exhales a strong penetrating and nauseous odor. The bruised leaves are applied exteriorly to wounds. M. Mutis was desirous of ascertaining if inoculation with the guaco would render a person obnoxious to the bite of serpents for a lengthened period, but was prevented from completing his experiments by the refusal of the Grand Court of Justice at Santa-Fe to allow him to make them on criminals condemned to death. The negroes who wish to protect themselves against snake bites take the following precautions:—They make two incisions on the feet, two on the hands, and one on each side of the chest. They express the juice of the leaves of the guaco, which they pour on the incisions, as if inoculating. Before the operation they make the patient drink two spoonfuls of the juice, and they recommend his doing the same five or six times a month, to continue the virtues: one of the leaves of the plant is usually carried about the person, and the odor is said to have a stupifying effect on the reptiles.—*Alibert's New Elements of Therapeutics*, p. 500.

SOME PRACTICAL OBSERVATIONS UPON THE FORMATION AND GROWTH OF CRYSTALS.

BY MR. WM. COPNEY.

In the following paper it is not contemplated to indicate or explain the methods by which these substances are prepared upon the large scale, but to offer to the chemical and pharmaceutical student some suggestions, whereby, when the subject of crystallography comes under his notice, he may be enabled to prepare for himself the great majority of those salts whose forms he is called upon to understand.

It may not, therefore, be out of place, to introduce the subject

by a brief statement of the modern mode of classifying these bodies.

Crystalline forms are collected into six groups or systems.

These are comprehended by two classes. To the first belong all those whose *axes* are of equal length, and at right angles to each other; to the second, those, the axes of which are of unequal length, and are not always at right angles to each other.

Class 1. The Equiaxed.—Contains one system only, the Cubical or Regular, and to which a very large proportion of chemical and pharmaceutical salts belong. Common salt, alum, and iodide of potassium may be mentioned as examples. There are those who maintain that all the metals partake of the forms of this system.

Class 2. The Unequiaxed.—Here are included the remaining five groups, which are not improperly subdivided into *a* the dimetric, and *β* the trimetric.

To the dimetric belong the second system, or the square prismatic, which calomel, percyanide of mercury, and ferrocyanide of potassium serve to illustrate; and the third or rhombohedral, of which we have an example is calcareous spar.

The trimetric contains the fourth or right prismatic, of which sulphate of magnesia, sulphate of zinc, and citric acid are modified examples. The oblique prismatic well shown in sulphate of soda, binoxalate of potash, and tartaric acid; and, lastly, the doubly oblique prismatic, which will be easily remembered from its containing, among others, sulphate of copper and quadroxalate of potash.

The first point of importance in the production of well-formed crystals, is to ascertain the most suitable degree of saturation of the solution.

The proportions usually quoted in books, although frequently approximative, are not generally the best. Moreover these proportions must of necessity vary with the temperature. As a general rule, a completely saturated solution is not the most eligible, for, upon the slightest reduction of temperature, a considerable quantity of small crystals are deposited, while from a solution somewhat more dilute, fewer, larger, isolated, and more perfectly-formed crystals are generally obtained. A little practice will

soon enable us to define the most suitable condition in this respect.

In cases where the substance to be crystallized has to be eliminated, as the crystallizable alkaloids, vegetable acids, &c., the density or specific gravity becomes the only test by which to ascertain the proper degree of concentration. But here, again, we do not always succeed; for, although we may have found that very fine crystals were obtained on an occasion when the solution had an ascertained density, yet, unless the apartment into which it was set aside shall always have pretty nearly the same temperature, the crystals will not be satisfactorily produced.

So that, having ascertained, in the one case, the best proportion of saline substance for solution in water, supposing that to be the menstruum, and the most suitable density in the other, care must be taken that the place where both are set aside, shall have a temperature subject only to a trifling variation. Underground places answer very well, in many instances; but in others, it is better that the temperature be a little higher, since it is found that if they be crystallized at a temperature lower than the average, they are apt, at a higher one, to give up a portion of their water, to become fluid, or to crack.

These conditions being determined, and a number of crystals obtained, we have now to consider the best mode of insuring their subsequent symmetrical growth. This may be effected in three ways, either by adding, at stated intervals, additional quantities of the salt dissolved in a small quantity of the solution itself; by adding to the solution a fluid capable of uniting with the menstruum, but in which the salt is insoluble; or, by an appropriate evaporation, *i. e.*, by reducing the solution to a given weight, and returning the crystals when it has sufficiently cooled, or by a continuously spontaneous evaporation, in a warm atmosphere, as in the cases of protonitrate (nitrate of the sub-oxide) of mercury, and sulphate of manganese.

Next in importance are the arrangements which affect the position of the crystals. For prisms (right or oblique) a flat-bottomed, smooth, shallow dish will be found the most suitable; for octahedrons, a cylindrical vessel, into which is suspended a piece of horse-hair or gut (to be had at the fishing-tackle warehouses, and known in the trade as "silk-worm gut.")

Matters being thus arranged, the solution is set aside for (say)

twenty-four hours. It is then removed from the vessel, and from the gut, in the one case, are removed all the octahedra, excepting those more perfectly formed together with the whole of those which may have attached themselves to the bottom of the vessel.

The prisms in the other case, which form upon the flat bottom of the vessel, are in like manner examined—the more perfect selected, the remainder removed. The respective liquors are then returned; at the bottom of the one are arranged the prisms, while in the other the gut is resuspended.

After another interval they are again similarly examined, small imperfect crystals removed, which, from the beginning, are to be preserved, the positions of the prisms reversed, and both—returned to their respective liquors—again set aside.

This removal of the small crystals is repeated daily, so long as any continue to be deposited, since by their growth, they would weaken the solution.

When the prisms and octahedrons have ceased to increase, and none, or scarcely any are deposited at the bottom, &c., the liquor may be removed to a cooler place,—the lower part of the building for instance—which in consequence of the temperature being more constant, is, perhaps, on the whole, the most suitable for the subsequent growth of the crystals.

When the liquor is at length so far reduced in strength that no further depositions are made, and no perceptible increase in the elected crystals is observable, the accumulated small crystals are redissolved by small quantities at a time, and added to the mother-liquor as before explained. These being exhausted, the crystals may be increased at pleasure, by preparing from a highly concentrated solution a quantity of the same compound, to be added gradually as before.

It remains to be added that in consequence of the liquor becoming denser in the lower than in the upper strata, and their consequent more rapid growth in the former, it is necessary not only to regulate the strength of the solution, in the manner referred to, but to reverse the position of the crystals themselves almost daily.

The gut, therefore, which has hitherto pierced the octahedra, must be cut off as close as possible, and attached externally by a noose, which will facilitate its removal and attachment.

It ought also to be added, that when a crystal is suspended, it

should be so arranged that two of the opposite planes may be placed horizontally, and that it is found expedient, for the purpose of perfecting the termini of the larger prisms, that they should be suspended vertically.

Several crystals were exhibited by Mr. Copney, which he had grown in the manner described in his paper. Among them were some perfect octahedra of chrome alum and common alum, of great size and beauty. The octahedron of chrome alum weighed $7\frac{3}{4}$ ounces, and the edges of the crystal were $2\frac{1}{2}$ inches in length. The octahedron of common alum weighed $6\frac{1}{2}$ ounces, and the edges were $2\frac{3}{8}$ inches in length. There was also a beautiful crystal, the nucleus of which was of common white alum, over which were depositions of a mixture of common alum and chrome alum, in such proportions as to give the crystal a beautiful pink, or slightly amethystine color. Still larger than these, however, was one of chrome alum, containing a little common alum, the weight of which was nine ounces, and the length of the edges $2\frac{1}{8}$ inches.

Besides, these crystals, there were some of unusually large size, of sulphate of magnesia, and of citric acid.

The whole of these crystals excited much admiration, and the author of the paper, a late pupil in the Society's school, was complimented for the skill he had manifested in producing such beautiful preparations from the small quantities of ingredients he had to operate upon. It was mentioned that the crystals of citric acid, which weighed nearly an ounce, were obtained from a pint and a half of lemon juice.—*Transactions Pharm. Society, May 1851.*

COMPOSITION OF IPECACUANHA ROOT.

By ERWIN WILLOCK.

The author has examined the root of *Cephaëlis Ipecacuanha* in Rochleder's laboratory at Prague, and found small quantities of fat, traces of a volatile oil, gum, starch, pectin, emetin, woody fibre, and also a peculiar acid, erroneously considered by Pelletier as gallic acid. The following are the results of this examination:—

Starch and Pectin.—If the triturated root be boiled with water, a brownish gelatinous liquid, having an unpleasant smell, is obtained. If this be strained through coarse linen, to remove the woody fibres, then diluted with a large quantity of water, and filtered through paper, a mucilaginous greyish substance remains on the filter, and, by drying, becomes hard, brittle and blackish-brown. When boiled with water, this substance yields a slightly yellow liquid, in which the presence of starch can easily be proved; if, however, ammonia be added to the boiling water, the liquid becomes dark-colored, and, upon the addition of diluted muriatic acid, gelatinous flocculi appear in it, which possess all the properties of pectic acid.

Gum and phosphatic salts.—The filtered liquid contains, besides emetin, and a few salts, a considerable quantity of gum. The liquid having been mixed with an aqueous solution of sugar of lead, let fall a brownish precipitate, which consisted, for the most part, of phosphate of lead, and the liquid filtered from this precipitate, yielded, when treated with the tribasic acetate of lead, a second precipitate, which was exhausted with water, and decomposed under water by sulphuretted hydrogen. The liquid filtered from the sulphuret of lead, was then evaporated to half its volume, and mixed with an excess of alcohol of 98 per cent., when a white substance precipitated, and was separated by filtration, washed and dried at 100° Cent.

This substance readily dissolved in water, and yielded, when boiled with diluted muriatic acid, grape sugar; when burnt, an incombustible residue remained behind, amounting to 1.14 per cent. The analysis showed 44.45 per cent. carbon, and 6.31 per cent. hydrogen, which corresponds to $C_{12}H^uO_6$, the formula of gum. In the alcoholic liquid filtered from the gum, the peculiar acid of ipecacuanha is contained. The liquid filtered from the precipitate produced by the tribasic acetate of lead, yielded, when treated with strong alcohol, a gummate of lead of a white color, which, being decomposed by sulphuretted hydrogen, filtered from the sulphuret of lead, and evaporated, yielded the largest quantity of gum. In the last mother-liquors, the emetin was contained.

Ipecacuanha acid, $C_{14}H_5O_6$. The powdered root was boiled with alcohol of 0.840, the filtered liquid treated with tribasic acetate of lead, the precipitate washed with alcohol of 0.830, and dis-

solved in diluted acetic acid, by which the phosphate of lead remains behind.

The acetic solution was mixed with the tribasic acetate of lead, the precipitate collected on the filter, and the filtered liquid decomposed by a small quantity of ammonia, by which a precipitate was obtained. Both precipitates were separately washed with alcohol of 98 per cent., mixed with ether, decomposed by sulphuretted hydrogen, and filtered from the sulphuret of lead.

The first precipitate gave a light yellow liquid. This was evaporated in the water-bath in a current of dry carbonic acid, till the ether had escaped. The residue was then mixed with water, filtered, in order to remove some fat, and digested with animal charcoal, and the reddish-brown liquid, filtered from the charcoal, and evaporated to dryness in the water-bath, in a current of carbonic acid. The residue, dried at 100° C., is the *hydrate of the ipecacuanha acid*. The second precipitate was treated like the first, and the analysis of the acid obtained from it, gave almost the same results.

Properties of Ipecacuanha acid.—This acid forms a reddish-brown substance, of a strong bitter taste; it is highly hygroscopic, soluble in ether, and more so in alcohol and water. The diluted watery solution yields with sugar of lead no precipitate; tribasic acetate of lead produces a brownish-white precipitate, which readily imbibes oxygen from the atmosphere, becoming at the same time darker colored. It also becomes darker colored by loss of water, and by drying under exclusion of the oxygen of the air.

A solution of a persalt of iron (chloride of iron) is colored green, even by a very diluted solution of the pure acid; ammonia produces a violet color, by an excess of ammonia the liquid becomes black like ink, and a blackish brown-sediment is formed in it. The salts of silver and mercury are reduced by the acid. The cupreous salts produce no precipitate with the acid, but on the addition of ammonia, a dirty, greenish-brown precipitate is produced. If a solution of the pure acid, mixed with alkalies, be exposed to the atmosphere, a dark, blackish-brown coloration, with absorption of oxygen, is very soon perceptible. This tendency to absorb oxygen, although in slighter degree, belongs to the pure acid, as well as to its salts. When heated, the acid fuses, and evolves a penetrating odor of formic acid, and leaves behind a vesicular coal, which is burnt with difficulty.

It dissolves in concentrated sulphuric acid with a brownish-red coloration, and on the addition of water, grey flocculi are precipitated. Nitric acid dissolves it with a deep reddish-yellow color; upon the application of a slight heat, a lively development of gas takes place, the solution simultaneously becoming yellow. Analysis of the two precipitates described above showed that the acid had the following composition:—

Carbon,	56.36	56.11	14 =	1050.0	56.37
Hydrogen	6.23	6.22	9 =	112.5	6.04
Oxygen,	37.41	37.66	7 =	700.0	37.59
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1862.5					

The compounds of this acid, examined by the author, had the composition represented by the following formulæ:—

Hydrate of ipecacuanha acid, $C_{14}H_8O_6 + HO$.

First salt of lead, $C_{14}H_8O_6 + PbO + HO$.

Second salt of lead, $6(C_{14}H_8O_6) + 5PbO + 4HO$.

Third salt of lead, $2(C_{14}H_8O_6) + PbO + HO$.

Fourth salt of lead, $6(C_{14}H_8O_6) + 7PbO + 6HO$.

The analysis of the hydrate, and of the various combinations with lead, prove that the acid contained in the ipecacuanha is not gallic acid, but a peculiar new acid. By these combinations, as by some reactions *e. g.* with the persalts of iron, it is shown to be very analogous to caffeo-tannic acid, whose presence in various plants of the family of the Rubiaceæ, gen. Coffeacea, namely, in the seeds of *Coffea arabica*, and in the root of *Chiococca racemosa*, has been proved. The difference between the two acids consists only in the proportion of oxygen:

Caffeo-tannic acid, $= C_{14}H_8O_7$.

Ipecacuanha acid (anhydrous), $= C_{14}H_8O_6$.

By the discovery of this acid, the group of those acids which are contained in various plants of the family Rubiaceæ, has been increased by one member:

Catechin, from *Nauclea Gambir* (dried *in vacuo*) $= C_{11}H_9O_9$.

Kinic acid (in its salt of lead,) $= C_{11}H_9O_8$.

Caffeo-tannic acid (dried at 100°) $= C_{14}H_8O_7$.

Ipecacuanha acid (anhydrous,) $= C_{14}H_8O_6$.

London Pharm. Jour., June, 1851, from *Central Blatt*, 1851.

ON THE COMPOUNDS OF IODINE WITH QUININE AND MORPHINE.

BY F. L. WINCKLER.

Equivalents of iodide of potassium and sulphate of quinine dissolved in boiling water furnish regular crystals of sulphate of quinine free from iodine; and similar results are obtained when other salts of quinine with oxyacids are employed instead of the sulphate. Very different results are obtained with the hydracids. Equivalents of muriate of quinine and iodide of potassium deposit a small quantity of a turpentine-like precipitate of iodide of quinine. Further experiment showed that, to decompose the muriate of quinine, 4 equivs. of iodide of potassium are requisite, and there is then produced a compound of—

+

Iodide of Quinine, $\text{Ch}^2 \text{I}$.—This compound has, when dry, the properties of a resin; after cooling, it is very easily reduced to powder, without becoming electric on friction, like pure quinine; and it furnishes a perfectly white inodorous powder, of an extremely bitter taste, which does not alter in the air. The compound is more soluble in water than the sulphate of quinine, and almost in every proportion in alcohol and in ether; all the solutions are perfectly clear and colorless, and leave on evaporation the iodide of quinine in the form of a transparent resin. The salt is instantly decomposed, with elimination of iodine, by concentrated sulphuric and nitric acids, and by chlorine; when burnt upon platinum foil, it left not a trace of potash; the cinder is difficult to burn. It furnished on analysis—

Quinine, . . .	71.58	2 =	4111.024	72.166
Iodine, . . .	28.42	1	1585.570	27.834

+

Iodide of Morphine, MoI , is obtained by dissolving 120 equivs. of dry acetate of morphine in 8 times the weight of cold distilled water, adding if necessary a few drops of pure acetic acid, and mixing the filtered solution with a solution of 60 equivs. of iodide of potassium. After some time the salt crystallizes out in very slender crystals, which, however, are obtained of much larger size when the mixture is heated on the water-bath, and is allowed to cool slowly. In this manner it is obtained in transparent, shining,

colorless, four-sided prisms, which cannot be distinguished from those of the sulphate of quinine. Indeed in the dry state it would be perfectly impossible to distinguish between these two compounds without the aid of chemical reagents.

Iodide of morphine is not perceptibly soluble in cold water ; it dissolves abundantly in hot water and readily in alcohol ; the solutions have a very bitter taste. Analysis gave—

Morphine, . . .	71.4	1 =	3927.0	71.24
Iodine, . . .	28.6	1	1585.6	28.76

The author draws attention to the probably important medicinal properties of these compounds.—*London Chem. Gaz.*, April 1, 1851, from *Jahrb. fur Prakt. Pharm.*, xx. p. 321.

ON THE PRESERVATION OF ALIMENTARY VEGETABLE SUBSTANCES.

BY M. MASSON.

This process consists, first, in drying the matters at a moderate temperature in a stove for such time as is sufficient to expel the superabundant water which is not indispensable to the constitution of the vegetables, and then pressing them strongly in a hydraulic press.

The substances are first carefully picked, and the harder portions separated, as in the ordinary culinary method. They are next placed upon sieves of basket-work, or pieces of linen or canvass nailed upon a frame, and exposed to the action of hot air in a stove heated to about 118° F., for the most aqueous vegetables. A current of the heated air passes continually through the apparatus during the operation.

Some experiments were made by the Commission of the Academy to test the process.

920 kilogrms. of broccoli were picked, and yielded 725 kilogrms. of green matter for drying. After exposure in the drying apparatus for twenty-four hours to a temperature varying from 104° to 118° F., they were reduced to 69 kilogrms. of dry matter, having thus lost 656 kilogrms. of water, or 87 per cent. of their

original weight. The other experiment was made with spinach. 820 kilogrms. of raw spinach were picked, and thus reduced to 639 kilogrms. of matter for drying. These in twenty-four hours were reduced to 71 kilogrms. of dry matter, having thus lost 89 per cent. of their weight. Pressure in the hydraulic press subsequently reduced the volume, bringing the density to 550 or 600 kilogrms. for the cubic metre.

The vegetables subjected to this process present a satisfactory odor and appearance, retain their flexibility and natural color; and the form is so well kept in some, that they have the aspect of recently-gathered vegetables. When subsequently immersed in hot water, they absorb the principal part of the water lost during the desiccation. The following table exhibits the results thus obtained :—

Vegetable used.	Weight before immersion.	Temperature of the water.	Duration of the immersion.	Weight after immersion.	Proportion of weights before and after immersion.
Common cabbage, . .	280 grms.	122° F.	33 ^m	1.480	5.30
Brussels sprouts, . . .	139	122	38	0.630	4.53
Celery,	130	122	41	0.510	3.93
Spinach,	87	113	30	0.475	5.47

This mode of preservation of vegetables evidently offers peculiar advantages in its application to the use of the army and navy.—*London Chem. Gaz.*, July 15, 1851, from *Comptes Rendus*, May 19, 1851.

ON THE COMPOSITION OF THE BITTER PRINCIPLE OF ARTEMISIA ABSINTHIUM.

BY DR. E. LUCK.

Mein and Righini have described methods more or less tedious for preparing pure absinthine. The former chemist states that he obtained it crystalline and white. To obtain this substance, I proceeded in the following manner:—The dry herb was exhausted with alcohol of 0.863, and the clear liquid distilled to the consistence of a syrup, the residue transferred into a stoppered bottle, and well shaken with ether. After some time this separates with a yellowish-brown color. This treatment with ether is repeated until it no longer has a very bitter taste. The ethereal liquid is

distilled in the water-bath ; the residue consists of a viscid mixture of a blackish-brown acid resin and absinthine. On treating it with water to which a few drops of ammonia have been added, the black smeary resin is principally taken up, and the greater portion of the absinthine left behind.

In proportion as it becomes purer it acquires a pulverulent form. On adding a further quantity of ammonia, absinthine is also dissolved ; but on triturating with concentrated ammonia, far less passes into solution, because the compound of ammonia with absinthine is very sparingly soluble in ammonia.

To remove the ammonia, it is now digested with dilute hydrochloric acid, then washed with water, dissolved in alcohol, and solution of acetate of lead mixed with it as long as any turbidity results, filtered, and sulphuretted hydrogen passed into the liquid in order to decompose the excess of the lead salt. The alcoholic solution filtered from the sulphuret of lead is mixed with a small quantity of water, allowed to evaporate slowly in a warm place, when the absinthine separates in yellow resinous drops. These are soft, become coated when mixed with water with an opaque membrane, and in the course of some weeks all the drops become converted into hard masses, which externally are jagged and rough ; internally, radiate and indistinctly crystalline.

The color is brownish-yellow to yellow ; when pulverized, it furnishes a yellowish powder, of a faint, disagreeable, bitter odor of wormwood ; it has an intensely bitter taste, is sparingly soluble in water, and melts in boiling water. It dissolves readily in alcohol, somewhat less in ether, and is likewise soluble in concentrated acetic acid, from which it is partially precipitated by water. It has a tolerably acid reaction, and dissolves, as above stated, somewhat in an aqueous solution of ammonia, but far more readily in caustic potash, with a golden-yellow color. Cold sulphuric acid dissolves it at first with a reddish-yellow color, which, however, quickly turns indigo-blue by exposure to the air, apparently with absorption of oxygen. Water produces in this blue solution a dirty gray-green flocculent precipitate, and the supernatant liquid is of a rose color. After the flakes have been washed on the filter with water, they dissolve readily in alcohol with a yellow color, but sparingly in ether. This substance has no longer a bitter taste ; and its spirituous solution leaves on evaporation a

violet-blue amorphous residue, which again dissolves with a yellow color.

Hydrochloric acid dissolves absinthine with a yellow color, which on the application of a gentle heat passes into red; subsequently the color becomes darker, with a turbidity and separation of a brown mass: it dissolves in fuming sulphuric acid with a brown color. Heated upon platinum foil, it is partially volatilized in brownish-yellow bitter vapors, which condense into an amorphous substance, but the greater portion is carbonized. The substance, dried *in vacuo* over sulphuric acid, gave the following analytical results:—

Carbon	-	65.06	65.30	16 =	96	65.30
Hydrogen	-	7.60	7.65	11	11	7.48
Oxygen	-	-	-	5	40	27.22

The empirical formula for absinthine is therefore $C^{16}H^1O^5$, the rational formula probably $C^{16}H^{10}O^4 + HO$. The preparation of a pure compound of absinthine with a metallic oxide of constant composition is exceedingly difficult.

Absinthine was dissolved in alcohol and mixed with some caustic potash, carbonic acid passed into the dark golden liquid as long as carbonate of potash separated, and then some ether added and filtered. In this solution of absinthine and potash, acetate of lead produced a beautiful yellow flocculent precipitate of absinthine and oxide of lead; but in the course of a few minutes it was converted into heavy white oxide of lead, and the alcohol became colored yellow by dissolved absinthine. It was also found impossible to obtain the potash compound in a solid form. The spirituous solution of the bitter principle gives no precipitate with neutral acetate of lead, and but a slight turbidity with basic acetate of lead; I succeeded however in obtaining a lead compound in the following manner:—Basic acetate of lead and some ammonia were added to an alcoholic solution, and evaporated to dryness *in vacuo* over sulphuric acid. The dry residue was rubbed to powder, and treated first with water, and after drying with ether as long as anything was dissolved, and lastly alcohol was employed for washing. This compound gave 55.25 per cent. oxide of lead, leading to the formula $2(C^{16}H^{10})O^4 + 3PbO$, which requires 54.80 oxide of lead.—*Chem. Gaz. from Liebig's Annalen*, April, 1851.

POISONOUS PROPERTIES OF HOMERIA COLLINA.

(Nat. Ord. *Iridac.*)

Homeria collina, Sweet. Root a corm or tuberous bulb, covered with a fibrous reticulated, hardened coat. Shaft erect, smooth, paniculately branched. Branches 2-3 flowered. Spathe 2-valved, awned. Radical-leaf strap-shaped, narrow, caudate, concave, abruptly pointed, outreaching the shaft. Cauline leaves 2-3 much smaller. Corolla ephemeral, of a yellow or vermilion color.

I introduce this plant (which is known to almost every child in the colony as the *Cape Tulip*) not for its therapeutical use, but for its obnoxiousness. The poisonous qualities of its bulbs appear to have been known to some extent years ago, but, judging from the rapidity with which death ensued in a recent case, when they had been eaten by mistake, it must be of a very poisonous kind. To Doctor Laing, Police Surgeon of Cape Town, I am indebted for the particulars of a melancholy case of poisoning, caused by this bulb.

A Malay woman, somewhat advanced in years, with her three grand-children, respectively of the ages of 12, 8, 6, partook on the 18th September last (1850) of a supper, consisting of coffee, fish, and rice, and ate along with this, a small basinful of the bulbs of the *Homeria collina*. The exact quantity which each ate is not well known. They appear to have supped between 7 and 8, and retired to bed at 9 o'clock, apparently in good health.

About one in the morning, the old woman awoke, with severe nausea, followed by vomiting, and found the children similarly affected. She endeavored to call for assistance, but found herself too weak to leave her bed; and when, at five o'clock, assistance arrived, the eldest girl was found *moribund*, and expired almost immediately. The little boy of eight years died an hour afterwards, and the youngest child was found in a state of collapse, almost insensible, with cold extremities, pulse scarcely 50 and irregular, pupils much dilated. The symptoms of the grandmother were nearly similar, but in a lesser degree, accompanied by constant efforts at vomiting. By using diffusible stimulants she and this child eventually recovered.

The body of the eldest child was examined twelve hours after death. Marks of intense gastritis were found, particularly about

the cardiac and pyloric orifices. The inflammation extended throughout the whole course of the small intestines, and there was great venous congestion of the brain.

It is remarkable, that in cases of poisoning from *Fungi*, violent diarrhœa is present along with vomiting, whereas, in the present case, obstinate constipation prevailed.

Most probably, all plants, belonging to this genus partake of this poisonous property, which, in the case mentioned above, was not dissipated by boiling.—*Lon. Phar. Jour. & Trans.* July 1, from *Floræ Capensis Medicæ Prodrômus*, by L. Pappe, M. D.

ON KOKUM BUTTER, OR THE CONCRETE OIL OF MANGOSTEEN.

By JONATHAN PEREIRA, M. D., F. R. S.

I have recently received from my friend Dr. Frampton, a specimen of Kokum Butter, or the Concrete Oil of Mangosteen, accompanied with the following extract from a note written by Colonel Le Messurier, by whom the oil was brought from India :—

“The Indian name of mangosteen is *kōkūm*. You will, I think, find this oil of much use in all cases of chapped skin, hands, face, &c. Either use it scraping a little on to hot water, or by taking the powder and rubbing it on the hands or face.

“The preparation is made from the cold fruit, which is found abundantly on the slopes of the mountains on the western side of India, from 100 miles of Bombay to, I believe, Cape Cormorin.”

As very few notices of this oil (or rather vegetable butter) are to be found in any works, a few observations concerning it may not, perhaps, be uninteresting to the readers of the *Pharmaceutical Journal*.

The mangosteen referred to by Colonel Messurier as yielding this oil, is the *Garcinia purpurea* of Roxburgh, who does not, however, notice the oil. He observes that, “Of this evidently very distinct species, I have only specimens with leaves, and the ripe fruit sent by Dr. Berry under the name of *mate mangostan*, which is found in gardens only, and supposed to have been originally brought from the Eastern Archipelago. It differs from every other species in the whole fruit, which is about the size of a small orange,

being throughout of a deep purple color, even the pulpy aril of the seeds."

In Graham's *Catalogue of the Plants growing in Bombay and its vicinity* (published at Bombay 1839) there is the following account of the tree and oil:—

"GARCINIA PURPUREA, Rox. Flora, 2, p. 642. Wright's Illust., No. 8, p. 125. Rumph, Amb. 3, t. 33.

"The *kokum*.—*Brindao* of the Portuguese: a very elegant tree; head generally of a conical form; branches drooping; leaves dark green, shining; fruit round and smooth, not furrowed; size of a crab-apple; when ripe, of a purple color throughout; it has an agreeable acid flavor, and is eaten by the natives. Workers in iron use the acid juice as a mordant. A concrete oil is obtained from the seeds, which is well known, and used at Goa for adulterating ghee (*Bombay Courier*, 13th June, 1830;) in gardens, Bombay; pretty common in some parts of the Concan, in the ravines of Kandalla."

In the *Journal of the Asiatic Society of Bengal*, vol. ii., p. 592, for 1833, the mode of preparing the oil (which the writer calls *Ká-kùmb-ka-Tél*, or *Concrete Oil of Wild Mangosteen*) is thus described:—

"The oil is extracted from the seed by boiling. They are first exposed for some days in the sun to dry, and then pounded and boiled in water: the oil collects on the surface, and on cooling concretes into a solid cake. When purified from extraneous matter, the product is of a rather brittle quality; of a pale yellowish hue, the shade inclining to green; exceedingly mild and bland to the taste, melting in the mouth like butter, and impressing a sensation of cold on the tongue, not unlike what is experienced on allowing a particle of nitre to dissolve on the tongue. * * * * *

"The quantity of the concrete oil that may be obtained from the seeds may be taken at about one-tenth. From half a pound avoirdupois, or 3,500 grains of the seeds, I obtained 360 grains of the concrete oil in a moderate pure state. The above is somewhat more than one-tenth; and with better management, the product might perhaps be greater. It requires, however, long-continued boiling to extract it, and it is still more tedious to purify it from the fibrous matter of the seeds."

The same writer also observes that,

"The concrete oil of the mangosteen might, I apprehend, be advantageously introduced into pharmaceutical preparations. It is used by the natives as a healing application. I have noticed among its sensible properties, that it impresses a sensation of cold on the tongue; from which it would appear that it powerfully absorbs heat, as several salts do in the act of dissolving. It is easy to conceive that this property may often be of

general service in wounds or sores, accompanied with inflammation, which it is desirable to abate."

The specimens of kokum butter given to me by Dr. Frampton are in cylindrical masses of nearly three inches in diameter and between three and four inches long.

Kokum butter is a solid, firm, very friable substance. Between the fingers it feels greasy, somewhat like spermaceti; its color is pale yellow; it has a faint not disagreeable odor. In appearance it has considerable resemblance to a solid fat which was brought from India some years ago under the name of *Minia Batta*, *Stone Oil*, and which was said to be extracted by the natives of Borneo from a tree which is very abundant there (Dr. R. D. Thomson, *British Annual and Epitome of the Progress of Science*, p. 360, Lond. 1837.) In odor, however, it differs from the specimen of *Minia Batta* in my possession.

The anonymous writer, in the *Bengal Journal* above quoted, has drawn attention to the difference between the melting and congealing points of kokum butter. He found that it softened at from 90° to 100° , began to separate in a semi-fluid state at 106° , was partially opaque at 116° , but had attained perfect fluidity and transparency at 120° . Its congealing point, however, he found to be 90° . Mr. Redwood, who, at my request, kindly examined this subject, writes me that this butter "melts at about 98° F., remains fluid until cooled to 75° , and when it then begins to solidify the temperature rises to 92° , at which it becomes solid."

It is very slightly soluble in rectified spirit; more so in hot than in cold spirit. Mr. Redwood found that one ounce of rectified spirit dissolved only 1.7 grs. of the butter. In ether, however, it is readily soluble: one part of the butter dissolving almost immediately in about two parts of cold ether.

Heated with oil of vitriol it yields a crimson red solution, with the evolution of sulphurous acid.—*London Pharm. Journ.* Aug. 1851.

EXAMINATION OF THE VARIOUS METHODS OF ANALYSING ASHES.

In a paper entitled "Fundamental Experiments on the Determination of the Inorganic Constituents of Organic Bodies," M. Strecker has submitted to criticism the methods proposed by Rose and Erdmann for the analyses of ashes. According to Rose, we must distinguish in organic substances between teleoxidic, mero-oxidic and anoxidic inorganic constituents. Strecker found, in his experiments, that inorganic constituents could not be extracted by water and acids from the cinder of the charred organic substance, even with artificial mixtures of charcoal and various substances, when they were contained therein in comparatively small quantity; but, on the other hand, they were completely extracted when present in larger quantity. Now this behavior accords with that ascribed by Rose to anoxidic substances; they contain small quantities, of inorganic constituents, whilst the teleoxidic, as for instance urine, bones, &c., contain large quantities. Now the same is the case with the ashes of plants; and Strecker is therefore of opinion, that the reason why the inorganic substances are sometimes entirely removed by water and acids from the charred mass, and at other times only in part, is owing solely to the proportion of the ash to the cinder, and not at all to any peculiar kind of combination of the inorganic substances with the charcoal.

Strecker then draws attention to the circumstance, that we must not suppose, from the presence of alkaline carbonates in the aqueous extract, that they are always derived from salts of inorganic acids with potash, since tribasic phosphate of potash, after calcination with sugar, yields carbonate of potash to water.* Strecker also observed the production of cyanides and sulphurets on following Rose's method, which may give rise to slight errors in the analysis. There is also a loss of chlorine according to Rose's

* Does not the formation of alkaline carbonate, when organic matter is heated with tribasic alkaline phosphate, show in opposition to the statement of Liebig and other chemists, that tribasic phosphate cannot exist in the animal fluids? otherwise alkaline carbonate should be contained in the ash, which they found not to be the case.—*Ed. Chem. Gaz.*

method, a circumstance which has likewise been observed by Rose and Weber.

Strecker has convinced himself by experiment, that on burning the substances in a muffle according to Erdmann's method, any loss of chlorides and phosphorus can be avoided by the addition of some hydrate of baryta to the substances to be incinerated.* The same chemist has detected in the ashes of nitrogenous substances, for instance of the aqueous extract of blood, of bile, &c., the presence of salts of cyanic acid.

Staffel has likewise submitted Rose's method to examination, and has arrived at the same results as Strecker. For this reason, Staffel prefers the method proposed some time previously by Wackenroder, but so modified that the charred mass is always first exhausted with boiling water, after which the charcoal is incinerated. According to this method, the treatment of organic substances is divided into three parts as follows:—

I. The organic substances dried at 86° F., are carbonized in a crucible, the lid of which is stuck on with starch paste. The lid has a hole through which the gases escape; these are set light to. The charred mass is converted by pressure into a coarse powder, emptied into a flask, and repeatedly exhausted with boiling water until the liquid, which is generally transparent, leaves no perceptible residue on evaporation. When the extract is very alkaline, a current of carbonic acid is passed through it, after which it is evaporated to dryness in a platinum crucible until the weight of the residue remains constant.

The solution of the weighed residue is acidified with nitric acid. If, on treating the mass with nitric acid, a separation of silica occurs, it is collected on a filter and weighed. The liquid filtered from the silica is mixed with a solution of silver, and the chlorine determined from the amount of chloride of silver obtained. The liquid filtered from the chloride of silver is freed from the excess of silver by muriatic acid, and then an excess of ammonia added to it; if no separation of phosphate of lime occurs, the ammoniacal

* On this point Rose observes, "This certainly has many advantages. But the removal of a large quantity of sulphate of baryta, when lime is present, entails so much inconvenience, that the use of a weighed quantity of carbonate of soda is perhaps preferable."—*Ausfuhr. Handb.*, vol. ii. p. 782.

liquid is mixed with oxalic acid; and if this produce a precipitate of oxalate of lime, it is collected upon a filter, dried and calcined, and so the amount of lime found. The liquid filtered from the oxalate of lime is now mixed with some chloride of barium, the precipitate of oxalate, sulphate and phosphate of baryta collected upon a filter, dried and calcined, then dissolved in dilute nitric acid, when the sulphate of baryta, if any be present, is left behind, and from its amount the quantity of sulphuric acid is calculated. After removal of the sulphate of baryta, a slight excess of ammonia is added to the acid liquor, the whole set aside for some time; and in case any phosphate of baryta is deposited, it is collected, dried and calcined, and the phosphoric acid calculated according to the formula $\text{BaO} + 2\text{PO}^5$, proposed by Wackenroder. There is still the potash and soda to determine in the liquid filtered from the oxalate, sulphate and phosphate of baryta. The baryta still contained in the liquid is removed with pure carbonate of ammonia, the liquid filtered from the carbonate of baryta evaporated to dryness in a porcelain dish, and the residue heated to a faint red in a platinum crucible. The residue of alkaline chlorides is dissolved in water, and the potash precipitated from the solution with chloride of platinum; the liquid filtered from the potassiochloride of platinum is then examined for soda. The author however has, like other chemists, found no soda in inland plants.

II. This consists in the examination of the aqueous extract of the ash obtained by incinerating the charred mass after exhaustion with water. The charcoal is reduced to ash in a Hessian crucible having a slanting position, the ashes weighed, exhausted with hot water eight or ten times, when from 250 to 300 grms. of aqueous extract are obtained from 2 to 3 grms. of ash; these are divided into five or six parts. One part is acidified with nitric acid, mixed with solution of silver, and the chlorine determined from the weight of chloride of silver, and then calculated from the whole of the aqueous extract of the ash. A second portion is acidified with nitric acid, and then mixed with an excess of ammonia to obtain the silica; in general but mere traces are separated. A third likewise weighed portion of extract is mixed with chloride of barium, and the precipitate, if any form, collected, calcined and weighed; then dissolved in dilute nitric acid; and in case any insoluble sulphate of baryta remain, it is collected, and from its weight the

amount of sulphuric acid estimated. The liquid filtered from the sulphate of baryta is mixed with an excess of ammonia, then set aside for some time, the separated phosphate of baryta collected on a filter, dried calcined and weighed, and calculated according to the above formula. The liquid filtered from the mixed barytic precipitates is used for the determination of the potash and soda; it is freed by carbonate and caustic ammonia from baryta and other earths, evaporated to dryness, the ammonical salts dissipated, the residue dissolved in water and the potash determined by the chloride of platinum; the filtered liquid is examined for soda. A fourth weighed portion is mixed with oxalate of potash after acidification with nitric acid. When, as is generally the case, lime is present in the extract, the precipitate of oxalate of lime is heated to a faint red, and the lime calculated from the amount of the carbonate. The liquid filtered from the oxalate of lime is mixed with ammonia-phosphate of soda to precipitate the magnesia.

III. This consists in examining the insoluble portion of the charcoal ash left in II. This insoluble residue is digested with muriatic acid, and evaporated to dryness to remove the silica, again dissolved in warm muriatic acid, the residual sand and silica collected on a filter, the mixture dried, weighed, and the silica separated from the sand by solution in caustic potash.

The filtered acid liquid is divided into two equal parts, the one half employed for the estimation of the potash and soda, the other for the determination of the earths, peroxide of iron and phosphoric acid, according to the following plan. The one half is heated to boiling in a glass flask, mixed with acetate of soda and some acetic acid: the resulting precipitate, consisting of perphosphate of iron and phosphate of alumina, or of the first only, is collected on a filter dried, calcined and weighed. To separate the peroxide of iron from the alumina, the weighed precipitate is dissolved in muriatic acid diluted with water, and heated to boiling for some time with the addition of caustic potash. The separated peroxide of iron is collected upon a filter, and calculated for phosphate of iron according to the formula $\text{Fe} + \text{PO}^5$, proposed by Wackenroder. The alumina is precipitated from the filtered alkaline liquid by acetic acid as phosphate of alumina $= \text{Al}^2\text{O}^3 + \text{PO}^5$, dried, calcined and weighed. In this case we must not omit to examine the mixed precipitate obtained by acetate of soda for the presence of phos-

phate of lime, as frequently some is found in ashes which contain much phosphate of lime. If this precipitate be again dissolved in dilute muriatic acid, diluted with water, and heated to boiling with the addition of acetate of soda, it is obtained free from every trace of phosphate of lime. After the alumina and peroxide of iron have been precipitated by acetate of soda from the acid extract of the ash in the state of phosphate, the separated liquid is mixed with a solution of perchloride of iron (the amount of iron which is known and equal in weight to about the tenth or twentieth part of the entire weight of the ash), in order to determine the phosphoric acid still contained in it; the liquid itself is diluted with a considerable amount of water, heated to boiling in a flask with the addition of 0.5 grm. chlorate of potash, somewhat neutralized with carbonate of soda, and the whole of the iron added to the liquid thrown down as basic phosphate by a further addition of acetate of soda. The precipitate is collected on a filter, washed, dried, and ignited in a platinum dish after having been moistened with a few drops of nitric acid, and in this way a basic phosphate of iron obtained perfectly free from protoxide. The liquid filtered from the basic phosphate of iron is heated to boiling in a flask with carbonate of soda, in order to precipitate lime, magnesia and protoxide of manganese as carbonates. The filtered liquid is mixed with some phosphate of soda and ammonia, and the crystalline precipitate of ammonia-phosphate of magnesia obtained after twelve to twenty-four hours, added to that portion to be mentioned hereafter. The mixed precipitate of earthy carbonates is, after drying, heated to a strong red in a porcelain crucible, then dissolved in cold dilute nitric acid. If any manganese be present, it is left as Mn^3O^4 . The separated liquid is mixed with oxalate of potash, the oxalate of lime calcined after drying, and calculated from the amount of carbonate. After separating the oxalate of lime, the liquid is mixed with ammonia-phosphate of soda free from magnesia. The crystalline precipitate obtained in the course of twelve hours' standing is mixed with that previously obtained, calcined, and the weight of magnesia calculated from it.

As the salts of potash cannot be always completely removed from the ashes by water, the second half of the acid solution is separated from all the earths by carbonate and caustic ammonia, the liquid evaporated to dryness, heated to redness to remove the

ammonical salts, the residue dissolved in water, the potash precipitated by chloride of platinum, and the filtered liquid then tested for soda.—*Chem. Gaz.* March 15, 1811, from Liebig's *Annalen*, lxxiii. p. 339; and *Archiv der Phar.* lxiv. p. 1.

ON SCUTELLARIA LATERIFOLIA.

BY C. H. CLEVELAND, M. D.

One of the most valuable *nervines* that have been discovered for our use, is to be found by the side of many of our streamlets, and in low marshy places in nearly every part of this State, and in sufficient quantities to supply the entire profession from Maine to Texas, should they but be convinced, that with us grow plants possessing medicinal properties as useful and as potent as are obtained from distant climes.

Such, I think, must be the belief of all who will make a trial of the *Scutellaria laterifolia*, in the place of the English or German Valerian (*Valerian officinalis*), that has been the main article in use in this region in all *nervous diseases* since the day when *Asafoetida* went out of fashion.

The *Scullcap* has not only a most remarkable power of controlling the nervous excitability, as manifested in patients of an irritable temperament when fatigued, over excited, or suffering from slight physical derangement, but its most valuable properties are displayed in those severe and painful cases where we are led to use our most potent and active remedial means. In *Delirium-tremens*, *Tic-doloureux*, *Convulsions* from irritation of the ganglionic nerves or spinal cord, in *Chorea Sancti-viti*, *dental irritation* among children, as well as in the ordinary diseases of the nerves, where a soothing, quieting medicine is indicated, I have been led to prefer the *Scutellaria* above all o'her *nervines* or antispasmodics, except in those cases where an immediate effect is desirable. In such cases, of course we should resort to Chloroform, Ether, Musk, Castor, and the other drugs of the same class.

Among my reasons for this preference, I would mention the *tonic* property of the herb, which gives strength as well as quiet, its su-

dorific, and its *diuretic* powers—both tending to relieve the congestion that is usually present, which tends to perpetuate the disease. It never leaves that excitable, irritable condition of the system; when its soothing influence has worn away, that follows some of the other nervines; and it is so readily administered that but little delay need occur, and no evil result be anticipated.

I am led to call the attention of the profession to this plant in the earnest and decided manner I have used, mainly because of the high estimate I placed upon it; but in part from the disparaging remarks of the *United States Dispensatory*. I would not wish to detract from the fair and just fame of the compilers of that great work, or lessen the confidence that is so properly placed in it; but I think I know more of this plant, than those authors *could* know, and write according to my own observations. Without doubt the plant has been extolled too highly by some, and also recommended in cases where it has failed in answering the expectations of those who relied upon it, but not I think when used in such diseases as are indicated above. To me it has never seemed inert or powerless, and having had occasion to make *personal* use of it when the whole system was suffering severely from being poisoned by decomposing animal matter, I feel qualified to testify that “it *does* produce an *obvious* effect.”

I have used it in the form of a saturated *tincture*, a *syrup*, and a *cold* and *warm infusion*; and I prefer the infusions to the other preparations when they can be conveniently prepared; the cold when it is desirable to obtain the tonic, and the warm when the sudorific effect is demanded. Half an ounce of the dried leaves to a tea cup full of water, will be very strong, and it may be drank *ad libitum*.

Of its curative power in cases of *hydrophobia* I can say nothing, never having had the opportunity to give it a trial; but should such a case present itself, I should make a trial of the plant in conjunction with other means.—*New York Register of Medicine and Pharmacy*.

Waterbury, Vermont, June, 1851.

ETHEREAL SOLUTION OF IODINE.

By R. THOMSON, M. D.

TO the Editor of the Boston Medical and Surgical Journal.

Sir,—I beg to offer to your notice a preparation of iodine, which is as yet unknown to the profession, except to a few in this locality whose attention I have directed to its efficacy as a counter-irritant. I have employed it in my practice for upwards of ten years, and generally with the most satisfactory results, in the most of those cases where the use of the tincture is commonly indicated. It is applied in the same way as the tincture, by means of a camel-hair pencil rubbed over the part, until it begins to produce a burning sensation in the part; then cover it with a pledget of wadding, so as to prevent evaporation. For the first fifteen minutes the burning sensation is pretty severe, so as to alarm some patients. Yet it soon becomes tolerable, but usually continues to be felt for several hours. The next day the cuticle has a dry hardened feel, having the iodine color; and great relief to deep-seated pain is obtained. In the course of two, three or four days, vesication will be observed around the edges of the superficial eschar which has now commenced to suppurate; and as the destroyed cuticle cleans off, a very copious discharge of purulent matter takes place, and may be kept up for two or three weeks under the popular application of a cabbage leaf, or oiled silk, which I usually apply on the second day. The surface of the sore assumes a fine granular appearance, and heals without leaving a cicatrix. I have often thought that, in cases of chronic inflammation of the joints, this application is more efficient than the caustic issue, relieves pain quicker, and can sooner be repeated.

I have frequently derived great benefit from keeping up a discharge from the chest in chronic affections of the lungs, making a sore the size of quarter or half a dollar at a time, and opening a new sore as the other heals.

This solution is very simply prepared. I commonly use the sulphuric ether of the shops; but the stronger the ether, the more efficient is the preparation. Hence the importance of obtaining a good article and in full strength.

I commonly put a quantity of pure iodine into a phial, and add sulphuric ether until dissolved; that is, the ether must be perfect-

ly saturated. To make the solution as strong as possible, I have added a few grains of the iodide of potassium, which furthers the capability of the ether to take up more of the iodine. There are different modes by which this can be prepared, that will be readily suggested to your several readers. All of them, however, will tend to the same result.

In some cases it may be used at a reduced strength, according to the amount of counter irritation or stimulation which individual cases may seem to require.

Dover, N. H. June 27, 1851.

Varieties.

Hyracum.—This substance is much valued by many farmers, and well known among them, by the rather harsh and unpoetical name of *Dasjespis*. Thunberg and other travellers mistook it for a kind of bitumen; but it is in fact the secretion of a quadruped, which is common throughout the colony, and that lives gregariously on the rocky summits of mountains, viz: the *Klipdas* or *Hyrax capensis*. It is worthy of note, that this production has baffled the researches of eminent zoologists, who have failed, from even minute dissection, in discovering any specific secretory organ from which this matter could be derived. It may be asserted, however, that the *Hyracum* is produced by the uropoetical system of the animal just named, and in order to explain this seeming anomaly, it must be observed, that the Hyrax drinks very seldom, if ever. Its urine, like that of the *hare*, is not thin and limpid as in other quadrupeds, but thick and of a glutinous nature, From a peculiar instinct, these animals are in the habit of secreting their urine always at *one* spot, where its watery parts evaporate in the sun, while its more tenacious portions stick to the rock and harden in the air. The fresh urine of the hyrax is of a reddish tint, and this has given rise to the opinion of those who took this production for a kind of menstrual secretion.

This substance is common on our mountains, and is to be found mixed with earth and dirt near the caves or crevices where these animals have their haunts.

In smell, and in its therapeutical effect, the *Hyraceum* most resembles the *Castoreum*, a remedy which is decreasing in quantity every year, and may therefore be replaced by the former. A new article of export would thus be gained. Amongst the farmers, a solution of this substance is highly spoken of as an antispasmodic in hysterics, epilepsy, convulsions of children, St. Vitus' dance, in short, in spasmodic affections of every kind.—*Pharm. Journ.*, from *Florce Capensis Medicæ Prodromus*, by L. Pappe, M. D.

On Red Phosphorus. By Prof. A. SCHRÖTTER.—Two years ago, Schrötter showed that red phosphorus was not an oxide, but an allotropic modification of phosphorus, which can be effected not only under water and by the light of the sun, but also by a vacuum, and in gases which do not combine with phosphorus, and by the degrees of heat between 215 and 250° C. Furthermore, he showed that red phosphorus is amorphous, not so fusible or distillable, nor emitting so much light, and considerably less soluble and combustible than common phosphorus. Lastly, and what is most remarkable, he also proved that it is transformed into common crystallizable phosphorus when heated to 260° C. under exclusion of air.

Schrötter has since made the following discovery: if common phosphorus be exposed, during several days in a closed glass tube, to an uninterrupted heat, it not only changes into the red modification, but assumes even immediately a coherent form. In this latter state, the amorphous phosphorus is reddish-brown, on the fractured surface iron-black, of an imperfect metallic brilliancy, brittle, and breaks easily with a perfect conchoidal fracture; the fragments are irregular, and have pointed corners and sharp edges. The degree of hardness lies between that of calcspar and fluor-spar; the density at 17° C.=2.089, the same quoted by Böttger for common phosphorus. The streak of this mass displays a red color of the pulverulent amorphous phosphorus. If exposed at common temperature to the influence of the atmospheric air, it remains unchanged.* If some tendency to acidulation on fusion manifests itself, it originates from the presence of common phosphorus, which cannot easily be removed.

With regard to common phosphorus, Schrötter has found that it decomposes the water at a temperature of 250° to 260° C., so that spontaneously inflammable phosphuretted hydrogen is developed.—*Lon. Pharm Jour.* May, 1851, from *Buchner's Rept.*, 1851, No. 19, p. 107.

On the Phosphorescence of Phosphorus. By R. F. MARCHAND.—Berzelius first suggested the idea that the emission of light by phosphorus was merely the effect of evaporation, and the consequent molecular change of phosphorus.

*Physiological experiments render it probable that red phosphorus may be administered in considerable doses without any injurious effects.

Prof. Marchand has now proved the correctness of this opinion by a number of carefully performed experiments, the result of which is that phosphorus emits light in all gases and vapors with which it does not chemically combine. In some gases the temperature may be very low, and in others it must reach the boiling point of phosphorus.

The emission of light is, therefore, only a consequence of evaporation, during which very probably molecular changes take place. It differs from that which occurs when phosphorus becomes oxydized, and both kinds of luminous appearances may separately occur. The emission continues as long as the phosphorus is able to evaporate and has tension. It ceases when the phosphorus is covered with some coating, by which evaporation is impeded. The tension is excessively low at a temperature of 15°C ., but the emission of light does not become imperceptible until 22°C .

In a current of hydrogen, or carbonic acid perfectly devoid of oxygen, and at a proper temperature, phosphorus continues to emit light, as long as the vapors are carried off; neither litmus or starch with iodide of potassium betray any alteration, consequently, neither oxydation, nor formation of ozone, nor any change of the phosphorus takes place. It merely evaporates, and retains its vitreous condition in the dark, even when the experiment has been continued for many days.

If the experiment be performed in closed vessels, the development of light ceases after a short time, but only in consequence of the developed vapors impeding evaporation. As soon as this obstacle is removed, the emission of light reappears. The same also occurs on the Torricellian vacuum.

It is well known that gases and vapors which combine with phosphorus, *e. g.* the volatile oils and the different kinds of ether prevent its evaporation. It therefore follows that phosphorus emits no light in hydrogen, which has been deprived of oxygen by potassium, if the latter was contaminated with naphtha.

In compressed air phosphorus ceases to evaporate. Dr. J. Davy has stated, that a pressure of four atmospheres is necessary for this; but, Marchand found, that at a temperature of 50°C . two atmospheres sufficed to extinguish the phosphorus in dry atmospheric air. The same is the case with hydrogen and carbonic acid, if the pressure is suddenly removed; then not only does the phosphorus itself emit light, but there arises also a luminous vapor. The light disappears, however, as soon as the space is filled with the phosphorus vapor. When phosphorus becomes luminous in atmospheric air, not only evaporation but also combustion goes on, and in consequence, litmus paper is colored red.

Substances chemically related to phosphorus, such as sulphur, selenium, arsenic, and antimony, when they are vaporized, do not evolve light. But if the experiment be done in atmospheric air, these substances also possess

the capacity of modifying the oxygen and changing it into ozone.—*Ibid*, from *Ibid*.

Arctopus Root (Radix arctopi echinili).—Two cases, each containing about sixty pounds of the above drug, recently imported from the Cape of Good Hope, were put up to public auction on the 24th April, but met with no purchaser.

The root of *Arctopus echinatus*, Lin., nat. ord., *Umbelliferae*, is employed in South America as a substitute for sarsaparilla. A sample of that recently imported consists of dry, irregular pieces formed by the transverse section of the root, in diameter varying from half an inch to nearly two inches, and in thickness from three-eighths to less than one-eighth of an inch; the cut surface is of a dingy brown color, and each piece has a zone-like mark midway between its centre and circumference. In some pieces the centre is surrounded by a well-defined dark portion. The margin or cortical part is blackish. *Arctopus* root has a weak, bitter, somewhat acrid taste, causing a slight flow of saliva; it is almost devoid of odor. In its general appearance, it suggests the idea of small and much discolored *Columba* root.—*Lon. Pharm. Journ.*, May, 1851.

Cedrine, the Active Principle of Cedron Seeds.—At a meeting of the Paris Academy of Sciences, on the 7th of April, M. Dumas announced that M. Lecoy had succeeded in separating the active principle on which the therapeutic properties of the *cedron* depends, and which he has named *cedrine*.—*Ibid*.

Solution of Lac a Substitute for Collodion.—As a substitute for collodion, Dr. Mellez recommends a solution of powdered shell-lac in highly-rectified spirit. The solution when cold, becomes gelatinous, and is used by joiners for polishing furniture. Spread on taffeta or linen and applied to the skin, it shows all the properties of collodion. It is impenetrable to the air, water, fat, and the organic secretions; it does not irritate the skin, and can be employed instead of dextrin for fractures. Wounds heal remarkably quick when dressed with this solution.—*Ibid*, from *Buchner's Repertorium Bd.*, left. 3d, 398.

Removal of Carbonic Acid from Cellars and other places where it has accumulated.—Aubergier proposes to remove carbonic acid from cellars and other places, where, from fermentation or other causes, it has accumulated, by sprinkling about *liquor ammoniac*; this combines with carbonic acid to form carbonate of ammonia, and fresh air rushes in to fill up the space produced by the condensation of the acid.—*Ibid*, from *Moniteur Industriel*, 1850.

Preparation of Oily Emulsions.—The preparation of oily emulsions succeeds better, according to Overbeck, if the following proportions of gum be employed:—Different oils conduct themselves differently when rubbed down with gum; castor oil differing most in this respect from the other oils. In order to obtain a perfectly milk-white emulsion of castor oil, two drachms of gum are to be mixed with three drachms of water and one ounce of castor oil, which is to be poured, by a fine stream, into the constantly stirred mucilage. Any additional quantity of water is then readily taken up by the emulsion, which may also be prepared with only four scruples of gum, but without becoming quite white. For other oils half their weight of gum is required, and the quantity of water must be half the total weight of oil and gum. Thus one ounce of oil of almonds is to be first rubbed down with half an ounce of gum, and six drachms of water are then to be added at once. The so-called crackling [*Kracken*] of the emulsion appears here in a higher degree than after the usual method, and is a favorable symptom of the uniform distribution of the oil in the water.—*Lon. Pharm. Jour.* July, 1851, from *Central Blatt*, 1851, No. vi., p. 75.

Adulteration of the Oils of Lavender and Cassia.—Dr. Hartung Schwarzkopf obtained from a commercial house, which he does not in the least suspect of participating in the fraud, the oils of lavender and cassia, as being of the finest quality; the first of which does not at all possess the pure, agreeable perfume, but an accessory odor of turpentine and rosemary. This odor became more distinct when the oil was poured upon a cloth and moved about in the air, or when it was heated in a spoon. Iodine gave no trustworthy indications; but the adulteration with oil of turpentine was readily discovered when the oil was shaken with three times its quantity of alcohol of 0.83 p. weight, which was incapable of dissolving the oil. The presence of oil of rosemary could not be discovered by this test, since this oil dissolves in alcohol of the above strength. The oil of cassia possessed the pure odor of cassia, but was suspicious by its great liquidity. The usual tests for adulteration with spirits of wine gave no satisfactory results. Upon mixing the oil with water it did not become opaque, and a drop of the oil being allowed to fall into a glass filled with water produced no opaque streak. Perfectly dry calcium being thrown into the oil dissolved, and formed under the oil a liquid layer, which satisfactorily proved the presence of spirit of wine.—*Ibid*, from *Central-Blatt*, 1851, No. iv., p. 62.

Bleaching of Ivory by Sulphuric Acid.—Ivory knife-handles, which have become quite yellow from use, being left for from two to four hours in a watery solution of sulphurous acid, become white again. The acid in the gaseous form makes the ivory crack.—*Ibid* from *Ibid*.

On Bebeerine. By M. A. DE PLANTA.—An organic base has been known in commerce for some time past, which was obtained in 1834 by M. Rodie,

from the bark of a tree called Bebeeru, in the colony of Demerara, and which has been subsequently described under the name of *Nectandra Rodiei*, by Sir Robert Schomburgh.

To prepare the bebeerine in a state of purity the author first followed the process described by Dr. MacLagan. The impure sulphate of commerce was dissolved in water, and bebeerine precipitated by ammonia. After having washed it, it was mixed with hydrate of lead, and the mixture evaporated in a water-bath. The dry residue yields to ether impure bebeerine, which is obtained by evaporation of the ethereal solution in the form of a brownish, resinous mass. In order to purify this product, M. Planta treats it with acetic acid, which imperfectly dissolves it; to the filtered liquor he adds an excess of acetate of lead, and then potash, until a precipitate is formed. The combination of bebeerine and oxide of lead, which is thus obtained, is dried in a water bath, and exhausted with ether. On distilling away the ether, the bebeerine is left in the form of a syrupy mass, having a slightly yellow color. It is dissolved in absolute alcohol, and the solution in a concentrated state, added drop by drop, to cold water kept constantly agitated. It forms a thick precipitate, which may be collected on a filter, washed and dried without agglutinating.

When thus prepared, bebeerine is a colorless powder, free from smell, unalterable in the air, highly electric, and, when ignited on platinum foil, leaving a carbonaceous residue, which completely burns away. It melts at 356° Fah., and on cooling becomes a vitreous mass. Above 356° Fah., it decomposes without volatilizing. It has a strong alkaline reaction, and completely neutralizes the acids, forming uncrystallizable salts. It is very soluble in water, but dissolves more easily in ether, and in all proportions in alcohol.

The following are some of the reactions of hydrochlorate of bebeerine. Potash, ammonia, and the carbonates of these alkalis, separate the bebeerine in the form of white mucilaginous flakes, but slightly soluble in excess of the precipitant. Bi-carbonate and phosphate of soda form white precipitates, chloride of gold a reddish brown precipitate, and chloride of platinum a yellowish white precipitate. Corrosive sublimate, iodide of potassium, sulphocyanide of potassium, and tincture or infusion of nutgalls, give white precipitates. Tincture of iodine gives a Kermes brown, and picric acid a sulphur-yellow precipitate. Iodic acid colors the solution of the hydrochlorate first pure red, then reddish brown, and finally deep red.

According to the analyses of M. de Planta, the composition of bebeerine may be represented by the formula $C_{38}H_{21}NO_6$. It is not, therefore, isomeric with morphine ($C_{34}H_{19}NO_6$), as was thought by MacLagan and Tilley. When a concentrated solution of hydrochlorate of bebeerine is added, drop by drop, to a weak solution of chloride of platinum, an orange amorphous precipitate is obtained, which has the composition $C_{38}H_{21}NO_6 + HCl$, $PtCl_2$ — *Ibid*, from *Journ. de Pharm.*

Porcelain Baths and Steam Tubs, introduced by Messrs. Rufford and Finch (Stourbridge).—The superiority of porcelain over other materials usually employed for the construction of baths, consists in the nature of the surface, the cleanliness, and the light appearance. It is preferable to marble on account of not absorbing so much heat. The joints in the porcelain baths have always been an objection which it was desirable to overcome, and many attempts have been made to construct baths in one piece. Much difficulty was found in accomplishing this object on account of the tendency of the bath, from its size and weight, to lose its shape during the process of drying, and to crack when heated in the kiln. Messrs. Rufford and Finch have lately succeeded in obtaining the desired result, for which a medal was awarded by the Society of Arts. The first specimen of this description of bath was fixed in the St. Marylebone baths and wash-houses, above twelve months ago, and a very superior bath is now in the Crystal Palace, on the north-west division. Steam-tubs, wash-tubs, and other vessels of various forms, are also constructed of the same material. Some of these might be usefully employed for maceration and other pharmaceutical purposes.—*Ibid.*

An Act to Regulate the Sale of Arsenic, 5th June, 1851.—Whereas, the unrestricted sale of Arsenic facilitates the commission of crime: be it enacted by the Queen's most Excellent Majesty, by and with the Advice and Consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. Every person who shall sell any Arsenic shall forthwith, and before the delivery of such Arsenic to the purchaser, enter or cause to be entered in a fair and regular manner, in a book or books to be kept by such person for that purpose, in the form set forth in the Schedule to this Act, or to the like effect, a statement of such sale, with the quantity of Arsenic so sold, and the purpose for which such Arsenic is required or stated to be required, and the day of the month and the year of the sale, and the name, place of abode, and condition or occupation of the purchaser, into all which circumstances the person selling such arsenic is hereby required and authorized to inquire of the purchaser before the delivery to such purchaser of the Arsenic sold, and such entries shall in every case be signed by the person making the same, and shall also be signed by the purchaser, unless such purchaser profess to be unable to write (in which case the person making the entry hereby required, shall add to the particulars to be entered in relation to such sale, the words, "cannot write,") and, where a witness is hereby required to the sale, shall also be signed by such witness, together with his place of abode.

2. No person shall sell any Arsenic to any person who is unknown to the person selling such Arsenic, unless the sale be made in the presence of a witness who is known to the person selling the Arsenic, and to whom

the purchaser is known, and who signs his name, together with his place of abode, to such entries, before the delivery of the Arsenic to the purchaser, and no person shall sell Arsenic to any person other than a person of full age.

3. No person shall sell any Arsenic unless the same be, before the sale thereof, mixed with soot or indigo in the proportion of one ounce of soot or half an ounce of indigo at the least to one pound of the Arsenic, and so in proportion for any greater or less quantity: Provided always, that where such Arsenic is stated by the purchaser to be required, not for use in agriculture, but for some other purpose for which such admixture would, according to the representation of the purchaser, render it unfit, such Arsenic may be sold without such admixture, in a quantity not less than ten pounds at any one time.

4. If any person shall sell any Arsenic, save as authorized by this Act, or on any sale of Arsenic shall deliver the same without having made and signed the entries hereby required on such sale, or without having obtained such signature or signatures to such entries as required by this Act, or if any person purchasing any Arsenic shall give false information to the person selling the same in relation to the particulars which said last-mentioned person is hereby authorized to inquire into of such purchaser, or if any person shall sign his name as aforesaid as a witness to a sale of Arsenic to a person unknown to the person so signing as witness, every person so offending, shall for every such offence, upon a summary conviction for the same, before two justices of the peace in *England* or *Ireland*, or before two justices of the peace or the sheriff in *Scotland*, be liable to a penalty not exceeding twenty pounds.

5. Provided, That this Act shall not extend to the sale of Arsenic when the same forms part of the ingredients of any medicine required to be made up or compounded according to the prescription of a legally qualified medical practitioner, or a member of the medical profession, or to the sale of Arsenic by wholesale to retail dealers, upon orders in writing in the ordinary course of wholesale dealing.

6. In the construction of this Act, the word "Arsenic" shall include Arsenious Acid and the Arsenites, Arsenic Acid and the Arseniates, and all other colorless poisonous preparations of Arsenic.

THE SCHEDULE.

Day of Sale.	Name and Surname of Purchaser.	Purchaser's Place of Abode.	Condition or Occupation.	Quantity of Arsenic sold.	Purpose for which required.
1 September, 1851.	John Thomas	Hendon | Elm Farm.	Farm Laborer.	5 pounds	To steep wheat.

(Purchaser's Signature)

John Thomas.

Witness,

James Stone,

(Seller's Signature.)

George Wood.

Or if purchaser cannot write, Seller
to put here the words, 'cannot write.'

Grove Farm, Hendon.

— *Lon. Pharm. Journ.* July, 1851,

Wax and Stearine Candles.—According to established custom, wax candles only are held to be orthodox in Roman Catholic cathedrals and chapels. Some makers of stearine candles having endeavored to introduce their material, an objection was taken against the innovation, and the question was referred to the Pope, who gave his verdict as we are informed, in the following terms:

Pope. Is there not a little stearine in the wax candles? *Answer.* Yes. *Pope.* May there not be a little wax in the stearine candles? *Answer.* Yes.—*Pope.* Then you have wax and stearine—stearine and wax. I see very little difference.—*Ibid.*

Poisoning with Muriate of Baryta. By Dr. C. WOLF.—A student of medicine, who supposed that he had swallowed three teaspoonsful of sulphate of magnesia, was seized with tormina and vomiting; the pulse was weak and irregular; the tongue natural. Dr. Wolf at first supposed the case to be one of "summer cholera," excited by the purgative; but as in half an hour more he found his patient with ice-cold extremities; pulse 65, irregular and feeble; hands and feet powerless; paralysis of the left eyelid; the voice weak and incessant griping—he analyzed what remained of the so-called sulphate of magnesia, and found it to be muriate of baryta. The patient took only some sulphuric acid and castor oil, by which the griping was soon removed, but there came on retention of urine requiring the catheter. The muscular powerlessness soon disappeared, and in three days the patient was quite well. He had taken altogether three drachms of the salt. Dr. Wolf detected the chloride of barium in the evacuations by incinerating them.—*Ibid*, from *Casper's Wochenschrift in Schmidt's Jahrbücher*, No. 1, 1851.

Poisoning with Prussic Acid.—Mr. William Callum, auctioneer and proprietor of the Cheapside House Repository at Birmingham, has committed suicide under very lamentable circumstances. It appeared at the inquest, that Mr. Callum had for some time exhibited symptoms of a mind ill at ease, and he drank deeply, as a witness believed, to drive unpleasant thoughts from his mind; he had been straitened for money, and after his death no fewer than three writs were found upon him. He was of an excitable mind and irritable nature. His pecuniary embarrassments drove him to engage in bill transactions, and the end was a criminal act. A check for £1000, purporting to be signed by Sir George Chetwynd, was presented by Mr. Callum, or sent by him—the matter is not clearly reported—to Birmingham bank. Soon afterwards it was discovered to be a forgery. Mr. Suckling, the solicitor of the bank, with Mr. Glossop, inspector of the detective police, went to Mr. Callum's house at Balsall Heath. Mr. Suckling informed Mr. Callum of his errand, conversed with him, and announced that he must give him into the custody of the inspector. Callum

requested that he might be allowed to see his wife before he was taken away ; and Mr. Suckling readily assented. While he had his arm around his wife's neck, the unhappy man swallowed the contents of a phial : Mrs. Callum noticed the act, and screamed. When the officer entered the room, Callum managed to utter "No," to his wife's statement, and could not articulate more. The phial had contained prussic acid. A surgeon was sent for ; but before he could obtain any remedies, if such there were, the patient was dead—in fifteen minutes after swallowing the poison. The appearance of the body a short time after death, showed that a large quantity of the poison had been taken. The jury referred the act to "temporary insanity."—*Lon. Pharm. Journ.*, Aug. 1851.

Poisoning with Oil of Bitter Almonds.—On Thursday, July 24th, Mr. William Carter, the Surrey coroner, held an inquest of some hours duration, at the Queen's Arms Tavern, Spa Road, Bermondsey, on the body of Mrs. Sarah Spencer, aged twenty-six years, the wife of Mr. Spencer, the perruquier and perfumer, of King William Street, City, who died from the effects of prussic acid, at her private residence, No. 4, Spa Road. A great number of witnesses were examined, but the following are the short facts of the case as detailed by the coroner: Some few weeks since the deceased was confined with her first child, and ever since she has been in an exceedingly low and desponding state, but from what arising no one was able to form the slightest conception. She frequently spoke to her attendants of her unhappy state of mind, and more than once said that she should soon die. She also said that she was not like some other parties, or she would have died some time back, (alluding, as the witnesses thought, to her having taken poison on previous occasions.) On Monday last, she went out and purchased at the shop of Mr. Elkington, the chemist, of 10, Bamford Lane, Bermondsey, a drachm of the essential oil of bitter almonds and a pennyworth of linseed meal. She made application for a quarter of an ounce, under pretence of wanting it to scent some pomatum, but Mr. Elkington refused to sell her a larger quantity than one drachm. On leaving the shop, she remarked that it was useless for Mr. Elkington to be so determined, for if she chose she could get a small quantity at each shop in the neighborhood ; and smiling, replied with all his precautions, he could not bottle up the Thames. She then repaired to her home, and the next morning her husband found her in bed in an insensible state. Dr. Paul, who had attended her in her accouchment, was sent for, and on his arrival found her suffering from the effects of prussic acid. Everything was done to save her life, but without effect, and she died in less than half-an-hour. The jury having consulted, returned a verdict of temporary insanity.—*Ibid*, from *Observer*.

Iodine.—An account has been published by M. Chatin of a series of experiments on animal and vegetable substances, with a view to ascertain the amount of Iodine that enters into their composition. All vegetables appear to contain more or less of this element, and particularly water-cresses. Wine is much more rich in iodine than water, milk richer in the element than wine, and asses' milk more rich in this respect than that of cows. Eggs contain a large portion of iodine. A hen's egg weighing an ounce and a half, was found to contain as much iodine as a quart of milk from the cow.—*Ibid*, from *Galignani*.

On the copying Electric Telegraph. By C. F. BAKEWELL.—In the method adopted for transmitting copies of writing, the letters to be transmitted are written on tin-foil with varnish, so as to present a conducting and non-conducting surface. The foil is placed on the cylinder of the transmitting instrument, and a metal style in connection with a voltaic battery presses on the surface of the cylinder as it revolves. By this means the electric current is continually broken when the style is resting on the varnish, and as the style is made to traverse by an endless screw from one end of the cylinder to the other, it passes necessarily over all the lines of the writing, and about eight times over each line. The receiving instrument is similar to the transmitting one, and on the cylinder of that instrument paper moistened with a solution of prussiate of potass in diluted muriatic acid is placed; the metal style on that instrument being a piece of steel wire. When the electric current from the positive pole of the voltaic battery passes through the steel point to the paper, a blue mark is made by the production of Prussian blue,—and when the cylinder is in motion, the effect is to draw a series of spiral lines on the paper; but as the lines are broken whenever the varnish writing on the transmitting cylinder interposes, the forms of the letters are transferred from one instrument to the other—the writing appearing of a pale color on a ground of blue lines drawn closely together. To produce this effect, it is requisite that both instruments should rotate exactly together, and this synchronous movement is attained by means of an electro-magnet—one instrument being made to regulate the other by retarding its motion at regular intervals. The regulation of the instrument is also greatly facilitated by a guide-line consisting of a strip of paper placed at right angles to the writing, by which means the person having charge of the receiving instrument can ascertain exactly how much the speeds of the two instruments differ, and by the addition or abstraction of weight can bring the gaps formed by the strip of paper to fall directly under each other—which indicates that the two cylinders are revolving at the same rate. It was stated, in answer to questions by members present, that two hundred letters per minute might be copied by the instruments exhibited, and that five hundred in a minute are attainable. To illustrate the facility which this means of telegraphic

communication affords for transmitting secret messages, an apparently blank piece of paper was produced, on which a message had been impressed invisibly before the meeting of the Section, and by brushing it over with a solution of prussiate of potass the writing became instantly legible.—*Ibid*, from *Report of British Association in the Athenæum*.

Occurrence of Mercury in Corsica.—An abundant deposit of pure cinnabar, which furnished 80 per cent. of mercury on analysis, has been discovered in the above island.—*Chem. Gaz.*, July, 1851, from *Journ. de Pharm.*, March, 1851.

On a new Cinchona Bark containing Quinoidine. By Dr. F. L. WINCKLER.—Among some samples of barks recently received from London, was one labelled *Bark from Maracaibo*. The author has examined this bark, and has obtained the remarkable result, that it contains kinovate of quinodine in combination with a very peculiar yellow coloring substance, which produces no precipitate or alteration in perchloride of iron, and a considerable amount of quinate of lime, but only an exceedingly small quantity of quinetannine, and not a trace of quina-red.

The hot decoction of bark obtained by treating 100 grs. with 4 oz. of distilled water, when strained hot, was perfectly clear, pale reddish-brown, and did not become turbid on cooling. It had an exceedingly disagreeable bitter taste, not at all like bark, and could be easily filtered. The filtered solution, on being tested with tannin, showed the presence of a considerable amount of alkaloid; perchloride of iron colored the decoction slightly greenish-brown, without rendering it turbid; oxalic acid precipitated lime. The sulphate of copper gave no precipitate, although the bark contains a large quantity of kinovic acid. The author explains this by assuming that it is firmly combined with the coloring principle and the quinoidine. In the alcoholic extract of the bark, the decomposition of this substance is not even effected by lime.—*Chem. Gaz.*, April, 1851, from *Buchner's Reperl.*, vol. v. p. 194.

On the Acrid Substance of the Root of Iris tuberosa. By M. LANDERER.—The acrid principle of *Iris tuberosa* is volatile. It separates upon the water distilled from the root as a stearoptene, in nacreous scales. When extracted from the root by means of ether, this evaporation furnishes an acrid extract, which, upon being rubbed upon the skin, produces considerable inflammation.—*Chem. Gazette*, April, 1851, from *Archiv. der Pharm.*, lxx. p. 302.

Editorial Department.

PRESCRIPTIONS IN ENGLISH.—The following communication from a New York correspondent, advocating the use of the vernacular in prescription writing, we publish for the benefit of our readers, many of whom agree with the author.

Mr. Editor,—Notwithstanding your phillipic against plain English names being used in writing prescriptions, I am of the opinion that such a law is the only remedy for numerous errors. The law, however, should not forbid the use of the scientific, or any other name, whether it be in the Greek, Latin, or any other language; but should require that the English name be used in addition to such other name. It should also require that the directions should be in plain English, or the native tongue of the patient. Then all would be plain and above board, with that honorable frankness which always characterizes good sense and real knowledge. This should apply equally to the quantities directed in the prescription, which should be put down in plain ordinary figures, or English words, thus: "1 ounce," "3 drachms," "equal parts," "15 drops," &c.

What is the object of this concealment practised by physicians—or rather, what is its utility? The object generally is to conceal from the patient and his friends, the medicine administered. But for what purpose? Evidently either to prevent their interference, to keep them ignorant, or to defend the craft of the physician. All these objects appear to me to be mischievous. In the first place, the patient has a full right to judge in his own case. He would be instructed if concealment were not used; and to promote the craft of the profession by secrecy, or a flourish of learned terms, appears to me quite exceptionable, and unworthy of the age in which we live.

In every instance, which has recently occurred, of death to the patient, the catastrophe would have been avoided, had the plain names been used. Shall life be trifled with in this manner, and death dealt out in the dark, when a little more frankness and homely plainness in the prescription would prevent it? It may be said that the apothecary should be more careful, or better qualified for his duties. This is very true, and the remark will equally apply to the physician. The life of the patient is in his hands, and carelessness or vanity is, in this case, a crime. Let the law guard against the fatal consequences, as well as may be.

I hope to see a law passed to this effect, in our State as well as yours, and also requiring that every bottle, box and parcel, of quack medicines, or medicines put up for sale in that style, shall contain a list of the articles used in its composition, and their proportions. Such a law would effectually obviate a mischievous concealment, which is now practised, and would inform the purchaser what he was about to administer to himself or his friend.

Yours, &c., OLIVER HULL,
New York.

We do not agree with Mr. Hull in his view of the necessity of writing prescriptions *entirely* in English; nor do we believe he has attributed the custom of employing Latin terms to the true motive in by far the greater

number of cases. We have no objection to the suggestion of writing out the quantities in full, as, for instance, "three drachms," or "fifteen drops;" but there is the same liability to error in the use of the digits as in the quantitative symbols usually adopted, as we see every day in the directions in English accompanying prescriptions. As to using the English name, in addition to the officinal one, as suggested, it is entirely superfluous if intended for the apothecary, provided the physician does his duty in writing the officinal name distinctly in full; but if the object is to enlighten the patient, let the physician give him a duplicate in English. What is wanting to render apothecaries inexcusable for errors is, that the physician should write his prescription distinctly—with ink, if possible—not to abbreviate the terms too closely, and use the nomenclature of the National Pharmacopœia, according to which our bottles and other recipients are labeled.

Whilst on this subject, we may mention that the carelessness in writing and compounding prescriptions, which has recently been productive of such unhappy results, has attracted the attention of the Philadelphia County Medical Society, who at a late meeting passed the following preamble and resolutions, viz.:

Whereas, The public mind has recently been much agitated in consequence of the carelessness of some of our apothecaries in compounding prescriptions, whereby life has, in several instances, been sacrificed; and whereas, it is *natural* that many of the prescriptions sent to our drug stores bear upon their face the impress of a high degree of carelessness by the manner and haste in which they are written; and whereas, humanity and the welfare of the community demand that something should be done with the view of arresting this growing evil. Therefore,

Resolved, That we earnestly recommend to the Physicians of the City and County of Philadelphia to write their prescriptions legibly on good paper, and in conformity with the nomenclature of the U. S. Pharmacopœia, which being strictly a National work, should alone be recognized as a guide in this country.

Resolved, That a committee of three be appointed to request the appointment of a similar committee on the part of the Philadelphia College of Pharmacy, for the purpose of consultation in reference to the subject referred to in the foregoing preamble and resolution.

We may as well state that the Trustees of the Philadelphia College of Pharmacy, at their August meeting, appointed a committee of three, in accordance with the request of the Medical Society.

NEW LEBANON; ITS PHYSIC GARDENS AND THEIR PRODUCTS.—The beautiful valley of New Lebanon, situated about 30 miles east of the Hudson river, in the State of New York, and noted for its attractive watering place, the resort of many pleasure-seeking travellers in the summer months, has long been celebrated for its gardens devoted to the culture of medicinal plants, with a view to the supply of apothecaries, druggists, and others in all parts of the United States. For a long time this business was solely in the hands of the people called "Shakers," who originated it as a regular pursuit, and who yet are largely concerned. During the past summer,

whilst on a visit to the valley of the Hudson, we accepted an invitation from Mr. Henry A. Tilden, to visit his gardens and laboratory situated in the township and village of New Lebanon, where he and his brother conduct an extensive business in the culture, drying and packing of plants, and the preparation of medicinal extracts. The Messrs. Tilden informed us that they have about forty acres cultivated under their immediate superintendence, somewhat in the following arrangement; 9 acres in *Taraxacum*, 2 in *Conium*, 3 in *Hyoscyamus*, 3 in *Belladonna*, 3 in *Lettuce*, 3 in *Sage*, 2 Summer Savory, 2 *Stramonium*, 2 *Burdock* and *Dock*, 1 *Marjoram*, 2 *Digitalis*, 2 *Parsley*, *Poppies*, and *Horehound*, 1 *Aconite* and *Balm*. The remainder are occupied with *Basil*, *Button Snake root*, *Blessed Thistle*, *Borage*, *Coriander*, *Feverfew*, *Hollyhock*, *Hyssop*, *Larkspur*, *Lovage*, *Marshmallow*, *Marygold*, *Mugwort*, *Mountain Mint*, *Southern Wood*, *Tansey*, &c. The narcotics, especially the *Hyoscyamus* and *Belladonna*, require a rich soil, and they exhaust the land rapidly. These last attain a height in many instances of five feet, but in general from three to four. They are liable to be preyed upon more or less, at all seasons of their growth by insects and worms peculiar to each, to such an extent in some instances, as to destroy the crop. *Conium maculatum* grows spontaneously in all that region of country, having become naturalized. It is seen along the roads, and in fields that have been abandoned for a time, attaining often the height of six feet, and presenting a striking object to the eye, by reason of its subdivided foliage. For this reason, the Messrs. Tilden do not cultivate this plant very extensively, but depend largely on that of spontaneous growth, which they gather from the country many miles around, as far as the Vermont line, and in Massachusetts. It is probable that the *Conium* obtained in this way is really more active, weight for weight, than the cultivated, being less succulent. We noticed the *Valeriana officinalis* growing with great luxuriance, and as high as five feet, although its culture has not as yet been much extended. Besides the varieties cultivated, large quantities of indigenous plants are purchased from collectors in the West and South, which are required in their business.

Their factory or laboratory is an extensive, oblong, three storied building, in the basement of which is a powerful steam engine which performs the double duty of propelling the powdering apparatus, and of driving a double acting air pump connected with their vacuum evaporators.

The recent plants intended for extracts are brought to the mill from the gardens, reduced to a coarse pulpy state by a pair of chasers, and subjected to a powerful screw press to extract the juice. This is clarified by coagulation, strained, and the pure juice introduced into the large vacuum apparatus, holding several hundred gallons, where it is concentrated rapidly to a syrupy consistence, at a temperature varying 110° — 130° , almost entirely free from the deteriorating influence of the atmosphere. In the construction of this apparatus, they have had a view to great extent of tubular steam-heating surface, so as to be able to accomplish the very large amount

of evaporation their business demands. The finishing apparatus is analogous to the vacuum pan of the sugar refiners. We witnessed the operation in progress with the thermometer standing at 112° F. They make annually about 8000 pounds of extracts from green plants and roots, consisting chiefly of Conium 2000lbs, Dandelion 2000 lbs., Lettuce 1200 lbs., Stramonium 500 lbs., Bitternut 800 lbs., Belladonna 500 lbs., Hyoscyamus 500 lbs., and so on. These extracts in the aggregate according to Mr. Tilden's estimate, are derived from about 300,000 lbs., of green material, and require the evaporation of more than 20,000 gallons of juice.

Besides these, a considerable amount of extracts are made from dry materials, both foreign and indigenous as Gentian, Rhubarb, Chamomile, May-apple, Horehound, Cohosh, etc. They are also about engaging largely in the manufacture of extract of Liquorice from foreign root.

In the powdering department they run burr stones and chasers, and use bolting and dusting apparatus. They powder large quantities of material on contract, besides that for their special business, amounting annually to from 50 to 60,000 pounds.

In the herb department, the quantity of material handled is very large. The plants are brought from the gardens into a large room in the factory building, where a number of girls are employed in picking them over to remove other plants accidentally present, and separating the decayed parts and the stems when desirable. They are then placed on hurdles, and exposed in the drying room till properly desiccated. Two presses are kept in operation, by which 2000 pounds of material are sometimes pressed in a week, and about 75,000 pounds per annum, including near three hundred varieties of plants.

At the time of our visit, thirty men and five girls were engaged in the several departments of their establishment.

When we consider the large amount of extracts of important drugs prepared in vacuo, which are thus thrown into the market to replace the former crude products, obtained by boiling down the juices, etc., in open vessels with a naked fire, according to the old method, we cannot but believe that much good will accrue to the medical practitioner in the increased power of these agents. The Messrs. Tilden have, thus far, been *directly* beneficial to the medical interests of the country. But they have also been indirectly useful by inducing their neighbors, the Shakers, from motives of competition, to adopt the vacuum pan, in lieu of the open boiler, in the preparation of their extracts. We have some few observations to make in reference to the medicine-producing department of this remarkable people, who received us kindly during a hurried visit whilst sojourning in their beautiful valley, but we are compelled to defer them till our next issue.

Pennsylvania Farm Journal. Edited by S. S. HALDEMAN, Lancaster, Pa.

We have received the numbers of this monthly publication, which dates its commencement April, 1851. If it is continued in the same spirit and

excellence that its pages thus far manifest, it will prove a valuable auxiliary in the promotion of the agricultural interests of this region. Its scope is comprehensive, and the tone of many of its articles of a high order. We wish it all success.

The Dispensatory of the United States of America. By GEORGE B. WOOD, M. D., and FRANKLIN BACHE, M. D. *Ninth Edition, carefully revised.* Philadelphia. Lippincott, Grambo and Co. 1851. pp. 1456, 8vo.

When a book becomes by usage an authority, those for whose guidance it is intended should watch it jealously, that no errors or fallacies creep into it, as it comes remodeled from the press. Our time has been too much occupied to review the work before us, and for the present we offer but a short notice.

The unexampled success of the Dispensatory of the United States has been owing less to any circumstances attending its publication, than to the intrinsic merits of the work itself; hence, as edition after edition has been thrown out from the press, its popularity has continued unabated, and we may safely say that at no former period of its history has the confidence of the Medical and Pharmaceutical professions in its accuracy and completeness been more general or stronger. In one sense it is the text book—the codex—of the United States Apothecary, more truly than is the Pharmacopœia; because, embodying, as it does, that work, very many apothecaries and physicians know the Pharmacopœia only through the medium of the Dispensatory—a fact which, however honorable to the authors of the latter, is to be regretted, as depriving the former of that universally authoritative position which it should hold. On the other hand, it may be said that had it not been for the deep interest taken in upholding the authority and dignity of the Pharmacopœia in their excellent Commentary, by the authors of the Dispensatory, that work would have been far less influential in assimilating the practice of pharmacutists than it now is.

The present edition has been attended with an unusual amount of labor, arising chiefly from the fact that the revision of no less than *three* of the *four* Pharmacopœias published in Great Britain and the United States have taken place since 1849. The progress of chemistry, the improvements in practical pharmacy, and the discoveries in therapeutics, have all tended to introduce changes in the national and collegiate medical authorities, and the radical substitution of a new system of weights for the old troy standard, by the Dublin College, has added to the labor and perplexities of the Commentators. Substances formerly found in the appendix as unofficinal have been brought out in the regular text, and several, then upheld by pharmacopœial authority have shrunk back into that *omnium gatheram*, as of lesser importance.

In the portion of the work dedicated to *materia medica*, fewer changes have been made, and yet fewer are apparent, than in the latter, or pharma-

ceutical portion; and whilst the former has increased from 751 to 765 pages, the latter has been swelled from 477 to 523, notwithstanding the utmost exertions of the authors to compress the matter into the smallest space consistent with perspicuity, to accomplish which they have frequently resorted to foot notes in small type. In the first division of the work among the new matter, will be found the articles Hemidesmus, or Indian Sarsaparilla, an officinal of the Dublin Pharmacopœia; Matico; Cod-liver oil under its new name Oleum Morrhue; Saccharum Lactis, of the Dublin Pharm.; Silex Contritus of the London Pharm., 1851, which is used as an agent in making Medicated Waters; and Spiritus Pyroxilicus, the Dublin name for the commercial Wood Naptha. Important additions will be found at the articles Cinchona, Elaterium, Wax, and many others.

In the second division, the preliminary chapter on pharmaceutical operations and apparatus, has been re-arranged and extended, and embraces most of the newer suggestions in practical pharmacy, not included in the general observations at the head of Classes of Preparations. Several new figures have been introduced, illustrative of apparatus or operations. No part of the appurtenances of the pharmaceutical establishments of the United States is less attended to, or has less expended on it, than that of apparatus. Indeed, the sparsity of such means in many stores renders the practice of purchasing some preparations—that should always be made by the apothecary himself—almost necessary. The authors of the Dispensatory, aware of the value of the process of solution called *displacement* or *percolation*, and of its liability to be imperfectly executed, have taken pains to render the details of the process as clear as possible.

The articles Gallic Acid, Chloroform and Collodion, are fully commented on; all the facts connected with these new remedies being carefully brought out. Under the head Alcohol, we find Alcohol Amylicum, or fused oil, the substance used in the Dublin Pharm. for obtaining valerianic acid; the stronger alcohols of the Dublin and Edinburgh Colleges; and the diluted alcohols, which are very properly placed under the one head. If the pyroxilic spirit of the Dublin Pharmacopœia was a preparation, it should come under this head, as *Methylic Alcohol*. Among the antimonials, we observe that the Dublin College have adopted pure oxide of antimony in the preparation of tartar emetic, and directs pulvis antimonialis to be made by precipitating a mixture of tartar emetic, phosphate of soda and chloride of calcium, so as to get a mixture of ter-oxide of antimony and phosphate of lime. This preparation must be much more active and uniform than that prepared by the old method.

The chapters Argentum and Arsenicum are much extended. Under the head of Plasters we notice a figure of the apparatus employed for spreading plasters with margins. The latest information relative to the officinal extracts has been incorporated in the several notices of that class. 'Fluid Extracts' peculiar to our Pharmacopœia, and now so much in vogue, are noticed in detail under a separate head. Ferri Pulvis, Citras,

Ammonio-citras, Liquor-nitratis and Valerianas are fully noticed. We might go on in this way and exhibit the changes and additions all through the work, but our space and time does not admit. Suffice it to say, that in every instance, accessible to the authors, where new light has been shed on the preparations or materials of medicine, they have spared no pains to reflect it through their commentary.

SCHOOLS OF PHARMACY.—The attention of our readers is directed to the Announcements of the Schools of Pharmacy, in the advertising columns.

The New York School commences its session on Monday, Nov. 3d, 1851, at their Rooms 511 Broadway.

The session of the Philadelphia School, commences on Tuesday the 16th of October, at 8 o'clock P. M., at the College Hall, Zane street, when Prof. Bridges will deliver a lecture introductory to the three courses. The regular lectures commence on Tuesday, Oct. 21st following.

We understand that the Cincinnati College of Pharmacy, intend opening their School this session. We cannot doubt that a wide field is open for the successful career of our western sister, one that should draw forth the most earnest endeavors of her teachers and patrons. Quackery, unblushingly presuming everywhere in this country, is more specially so in the great western valley, and needs all the ability of the advocates of scientific knowledge to withstand its baneful influence.

We have not, as yet, seen any announcement of the Massachusetts College of Pharmacy at Boston, recently established, and do not know whether they intend opening a Pharmaceutical School this winter, or not.

The prospects of our own School for the coming session are fair. Success to all.

STANDARDS FOR DRUG INSPECTORS.—We understand that the New York College of Pharmacy, has passed a preamble and resolutions, inviting the other Colleges of Pharmacy to meet in convention in New York, with a view to fixing on standards of quality, for the government of Drug Inspectors, to be recommended to Congress for adoption. This is an excellent movement, and very properly originates in New York, where by far the larger portion of the drug importations arrive. The object aimed at will require much deliberation to accomplish it effectually. We hope the other Colleges of Pharmacy will respond by sending delegates, and thus at least have an understanding in reference to the matter, which may subsequently result in the formation of a tariff of standards, calculated to work an important improvement in the quality of importations.

NOTICE TO SUBSCRIBERS.—The following is an Extract from the New Postage Law, which takes effect on July the 1st, 1851.

"Periodicals, &c., which shall be unconnected with any manuscript, or written matter, and which it may be lawful to transmit through the mail, of no greater weight than one ounce, for any distance not exceeding five hundred miles, one cent; and for each additional ounce, or fraction of an ounce, one cent; for any distance exceeding five hundred miles, and not exceeding one thousand five hundred miles, double these rates."

"Subscribers to all periodicals shall be required to pay one quarter's postage in advance; in all such cases the postage shall be one half the foregoing rates."

The weight of a single copy of this Journal is about 6 ounces, therefore the rate of postage will be as follows.

Within 500 miles,	-	-	-	-	6 cents per copy.
Over 500 and within 1,500 miles,	-	-	-	-	12 " "

If paid in advance, quarterly, the postage will be one half the above rates. Payable at the office of delivery.

ERRATUM.—At page 368, fifth line from the bottom, the formula should read— $\text{Fe}_2 \text{O}_3 + \text{PO}_5$.

We were wrong in stating (see foot-note at page 289) that a resolution declaring delegates from Colleges of Pharmacy and Dentistry were ineligible as members of the Medical Association. Such a resolution was offered, but was referred to a Committee, to be reported on at the meeting next year.

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